

Chapter 7

Health-Related Behaviors





Health-Related Behaviors

Individual choices can either protect us or put us at risk for disease. Consumption of fruits and vegetables, exercising, abstaining from smoking, and limiting alcohol are examples of behaviors that promote health and well-being (1, 2). Even though most Americans are aware of this, they continue to practice unhealthy behaviors that contribute to poor health outcomes and premature death.

While individuals are ultimately responsible for their own behavior, mounting evidence indicates that the context of one's life – in other words their history, family life, and culture – and the social determinants of health greatly influence the options a person has or the choices they can reasonably make (3-6). In many cases, barriers to healthy choices are greater than a person's ability to overcome them, regardless of motivation (5). For example, in Boston, many individuals live in neighborhoods with limited access to fresh food or safe places to exercise. Children are especially vulnerable because they have limited control of their environment, and yet establishing healthful behaviors in childhood can set the precedent for such behaviors in adulthood (3-6).

Strategies that help people adopt healthy habits must go beyond the individual. Educating individuals about health-promoting behaviors is necessary, but the social determinants of health must also improve in order to create a lasting impact (6).

A more in-depth discussion of these contextual factors can be found in Chapter 2: Social Determinants of Health of this report. In this section, we look closely at individual behaviors, including consumption of fruits and vegetables, physical activity, consumption of sugar-sweetened beverages, smoking, alcohol use, and marijuana use.

Fruits and Vegetables

Nearly everyone would benefit from eating more fruits and vegetables. Not only are they packed with nutrients, they are also naturally low in fat and calories, but still filling. A diet rich in fruits and vegetables has many health benefits, ranging from a lowered risk of heart disease to the prevention of aging-related eye diseases (7-10).

Despite the many benefits, intake of fruits and vegetables is extremely low for many Americans. Approximately 40% of adults in the United States ate less than 1 serving per day of fruits in 2015; 22% ate less than 1 serving of vegetables per day (11). The 2015 Youth Risk Behavior Surveillance System (YRBSS) indicates that approximately 7% and 5% of U.S. high school students had no vegetables or fruits, respectively, in the past week (12).

The minimum amount of fruits and vegetables a person should eat each day depends on age, sex, and physical activity. To determine the right amount of fruits and vegetables for you, dietary guidelines can be found on the web at <https://health.gov/dietaryguidelines/dga2000/document/build.htm>.

EXAMPLES OF 1 CUP



1 small apple



1 large banana



1 medium grapefruit



1 large orange



1 medium pear



1 small wedge watermelon



2 large or 3 medium plums



8 large strawberries



1 large bell pepper



1 medium potato



2 large stalks of celery



1 cup cooked greens or 2 cups raw (spinach, collards, mustard greens, turnip greens)



12 baby carrots
(or 2 medium carrots)

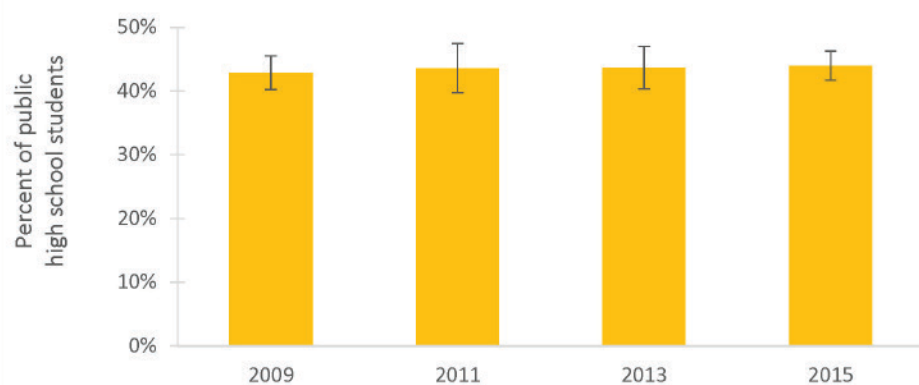


1 large sweet potato



1 large ear of corn

Figure 7.1 Public High School Students Who Consumed Fruit Less Than Once per Day by Year



NOTE: In 2009, 2011, and 2013, 15-20% of unweighted sample was missing data, and estimates should be interpreted with caution.

DATA SOURCE: Youth Risk Behavior Survey (2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

In 2015, 44% of Boston public high school students reported low consumption of fruit, defined as eating fruit less than once per day over the past week. This percentage did not significantly change between 2009 and 2015.



In 2015, 44% of Boston public high school students reported consuming fruit less than once per day over the past week.

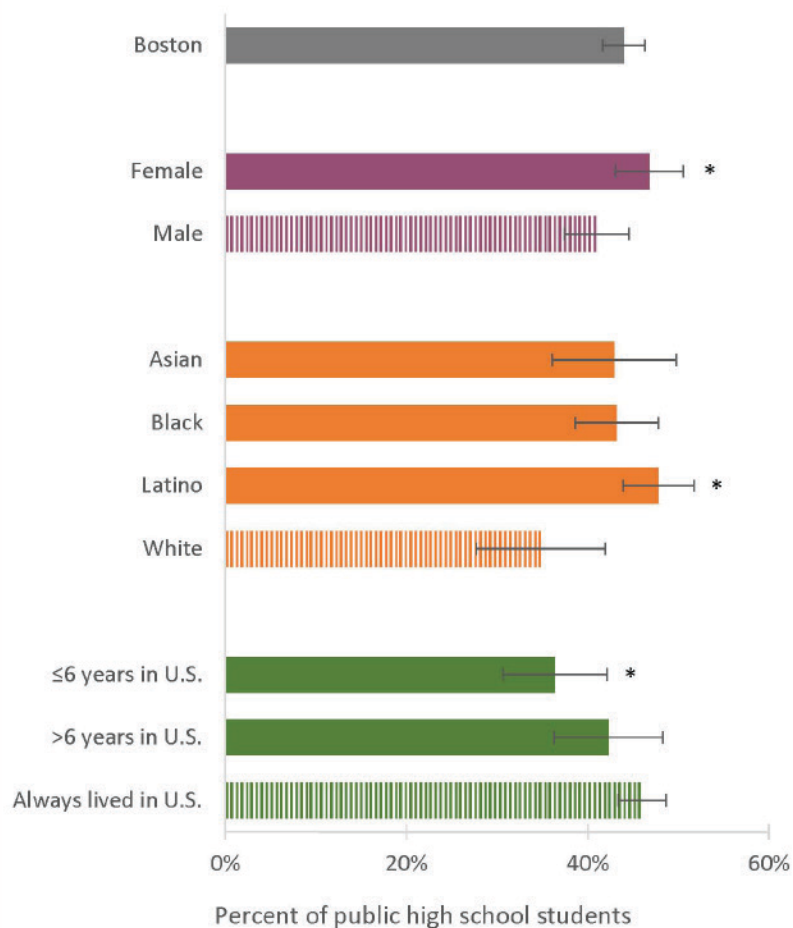
The percentage of students who reported low fruit consumption was higher for the following groups:

- Female students (47%) compared with male students (41%)
- Latino students (48%) compared with White students (35%)

The percentage of students who reported low fruit consumption was lower for the following group:

- Students who lived in the United States for 6 years or fewer (36%) compared with students who had always lived in the United States (46%)

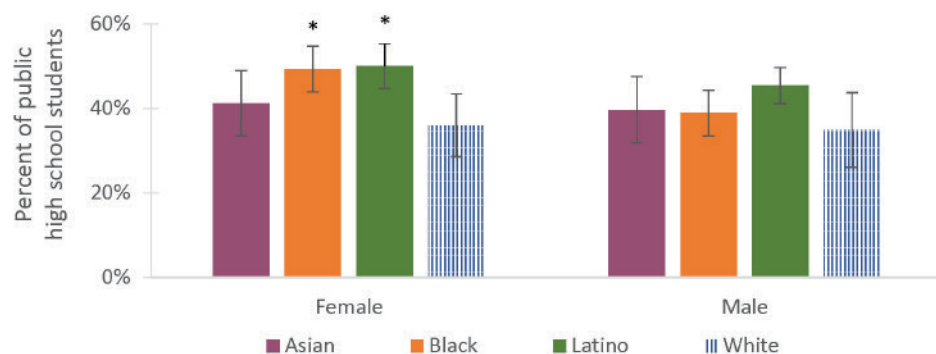
Figure 7.2 Public High School Students Who Consumed Fruit Less Than Once per Day by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

Figure 7.3 Public High School Students Who Consumed Fruit Less Than Once per Day by Sex and Race/Ethnicity, 2013 and 2015 Combined



* Statistically significant difference when compared to reference group

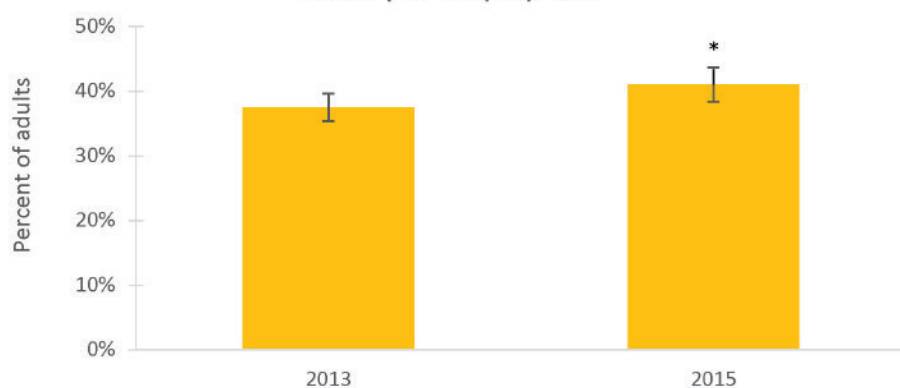
NOTE: Bars with patterns indicate the reference group within each selected indicator. In 2013, 15-20% of unweighted sample was missing data, and estimates should be interpreted with caution.

DATA SOURCE: Youth Risk Behavior Survey (2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

For 2013 and 2015 combined, a higher percentage of Black (49%) and Latino (50%) female Boston public high school students reported consuming fruit less than once per day over the past week compared with White female students (36%).

There were no significant differences for Asian, Black, and Latino male students compared with White male students.

Figure 7.4 Adults Who Consumed Fruit Less Than Once per Day by Year



* Statistically significant change over time

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

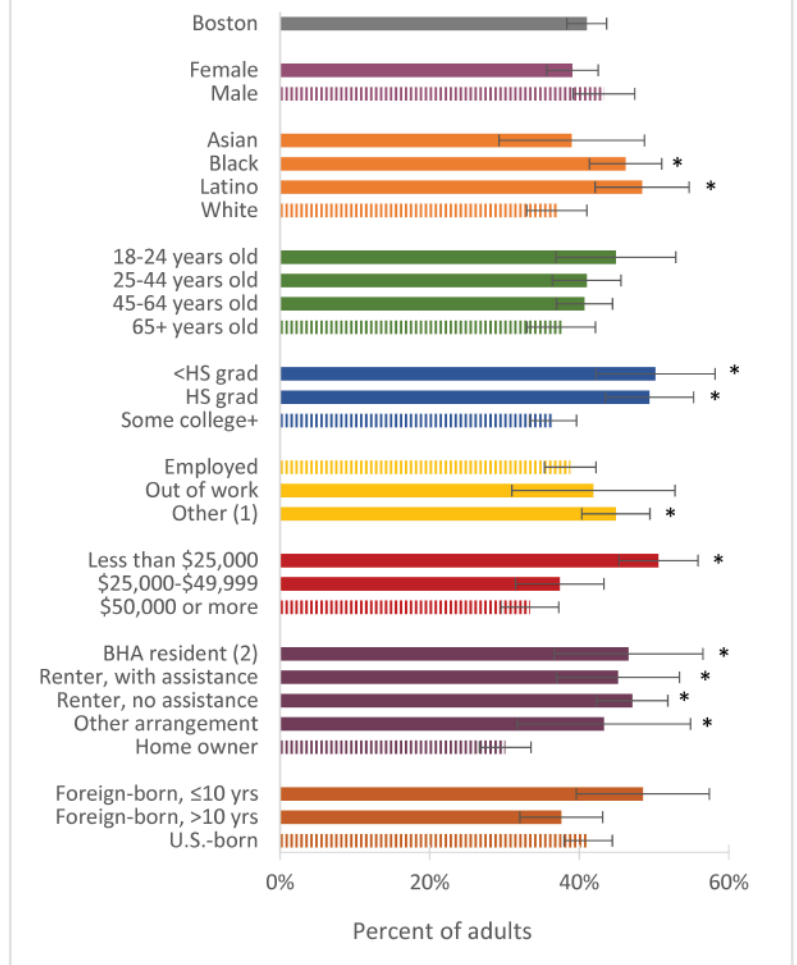
In 2015, 41% of Boston adult residents reported low fruit consumption, defined as consuming fruit less than once per day over the past month. This percentage increased from 2013 to 2015.

In 2015, 41% of Boston adult residents reported consuming fruit less than once per day over the past month.

The percentage of adults who reported low fruit consumption was higher for the following groups:

- Black (46%) and Latino (48%) adults compared with White adults (37%)
- Adults who did not receive a high school diploma (50%) and adults who received a high school diploma (49%) compared with adults with some college education (37%)
- Adults whose employment status was "other" (45%) compared with adults who were employed (39%)
- Adults who lived in households with an income of less than \$25,000 (51%) compared with adults who lived in households with an income of \$50,000 or more (33%)
- Adults who were Boston Housing Authority residents (47%), adults who received rental assistance (45%), adults who rented but did not receive rental assistance (47%), and adults with other housing arrangements (43%) compared with adults who owned their home (30%)

Figure 7.5 Adults Who Consumed Fruit Less Than Once per Day by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

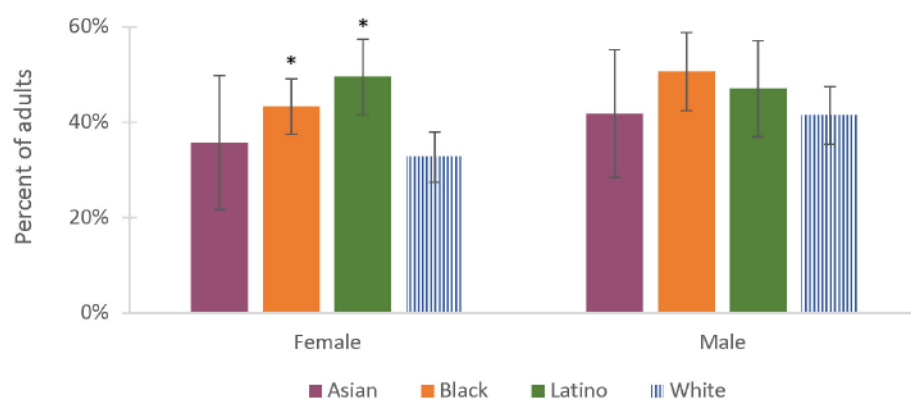
(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 7.6 Adults Who Consumed Fruit Less Than Once per Day by Sex and Race/Ethnicity, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

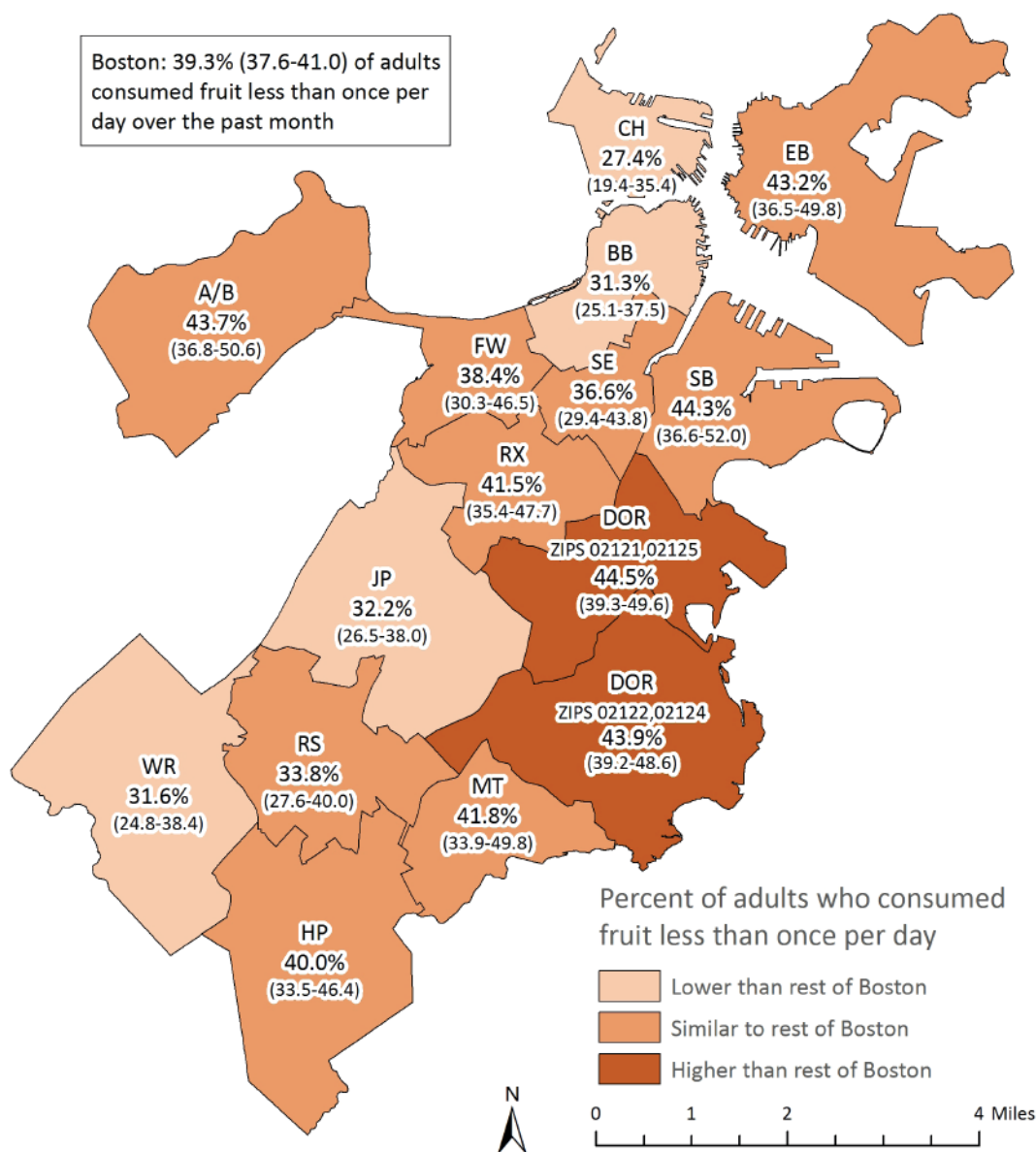
DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, higher percentages of Black (43%) and Latino (49%) female Boston adult residents reported consuming fruit less than once per day over the past month compared with White female adults (33%).

There were no significant differences for Asian, Black, and Latino male adults compared with White male adults.



Figure 7.7 Adults Who Consumed Fruit Less Than Once per Day by Neighborhood, 2013 and 2015 Combined



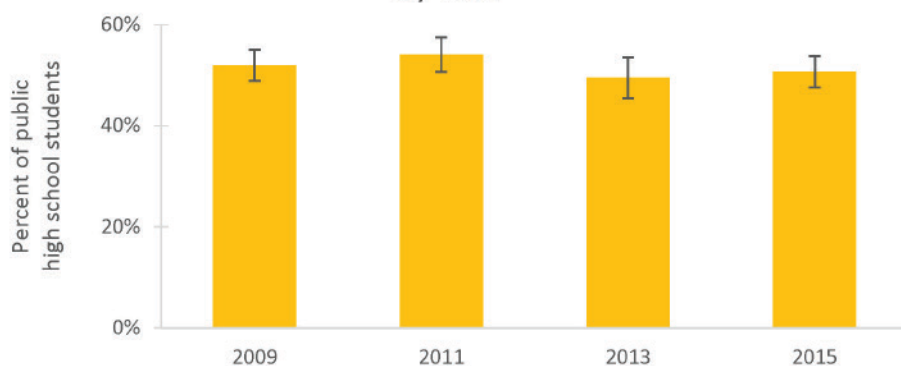
NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, higher percentages of adult residents in Dorchester (zip codes 02121, 02125) and Dorchester (zip codes 02122, 02124) reported consuming fruit less than once per day over the past month compared with the rest of Boston. Lower percentages of adults in the Back Bay, Charlestown, Jamaica Plain, and West Roxbury reported low fruit consumption compared with the rest of Boston.

Note: A higher percentage of consumption of fruit less than once per day indicates that the population, on average, is engaging in a less healthy behavior.

Figure 7.8 Public High School Students Who Consumed Vegetables Less Than Once per Day by Year



In 2015, 51% of Boston public high school students reported low vegetable consumption, defined as consuming vegetables less than once per day over the past week. The percentage of students who reported low vegetable consumption did not change between 2009 and 2015.

NOTE: In 2009, 2011, and 2013, 15-20% of unweighted sample was missing data, and estimates should be interpreted with caution.

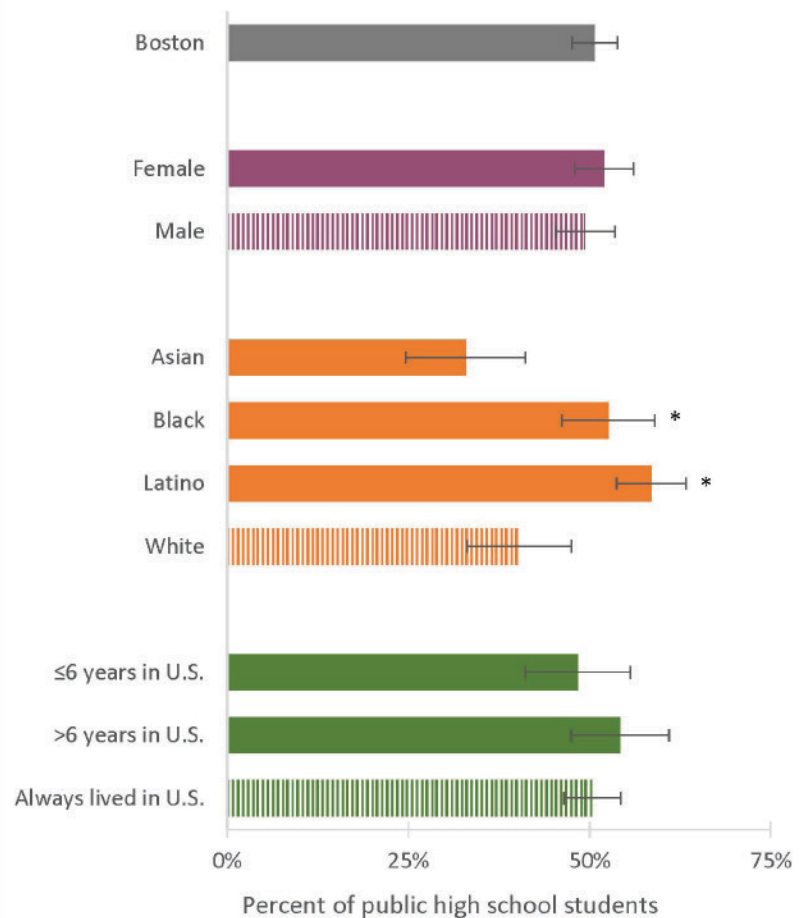
DATA SOURCE: Youth Risk Behavior Survey (2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools



In 2015, 51% of Boston public high school students reported consuming vegetables less than once per day over the past week.

A higher percentage of Black (53%) and Latino (58%) students reported low vegetable consumption compared with White students (40%).

Figure 7.9 Public High School Students Who Consumed Vegetables Less Than Once per Day by Selected Indicators, 2015

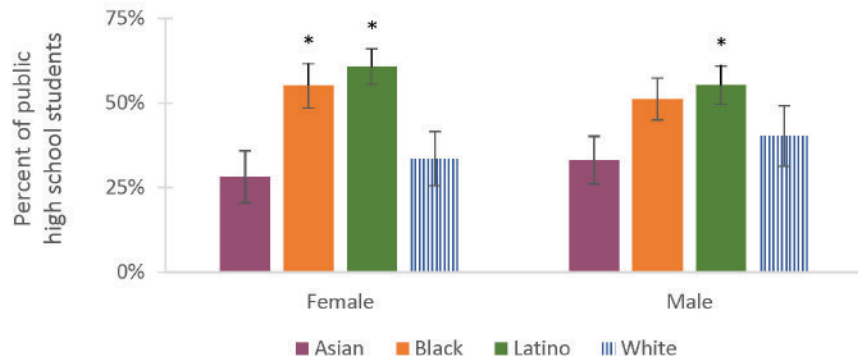


* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

Figure 7.10 Public High School Students Who Consumed Vegetables Less Than Once per Day by Sex and Race/Ethnicity, 2013 and 2015 Combined



* Statistically significant difference when compared to reference group

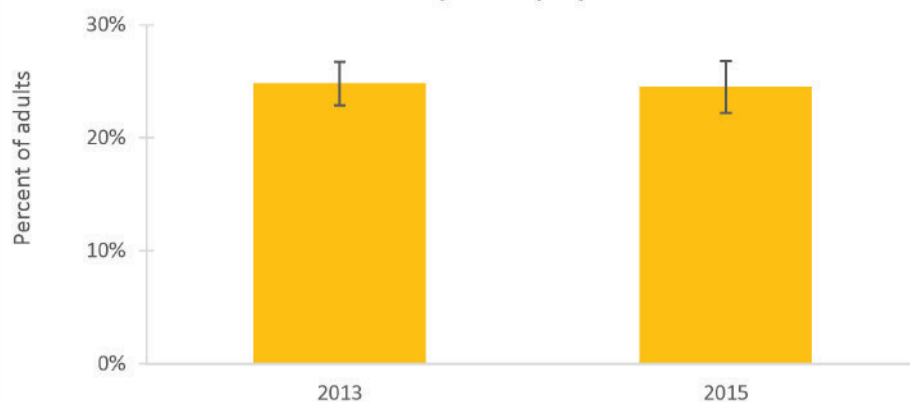
NOTE: Bars with patterns indicate the reference group within each selected indicator. In 2013, 15-20% of unweighted sample was missing data, and estimates should be interpreted with caution.

DATA SOURCE: Youth Risk Behavior Survey (2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

For 2013 and 2015 combined, a higher percentage of Black (55%) and Latino (61%) female Boston public high school students reported consuming vegetables less than once per day over the past week compared with White female students (34%).

A higher percentage of Latino male students (55%) reported low vegetable consumption compared with White male students (40%).

Figure 7.11 Adults Who Consumed Vegetables Less Than Once per Day by Year



DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

In 2015, 24% of Boston adult residents reported low vegetable consumption, defined as consuming vegetables less than once per day over the past month. There was no significant difference in this percentage between 2013 and 2015.

In 2015, 24% of Boston adult residents reported consuming vegetables less than once per day over the past month.

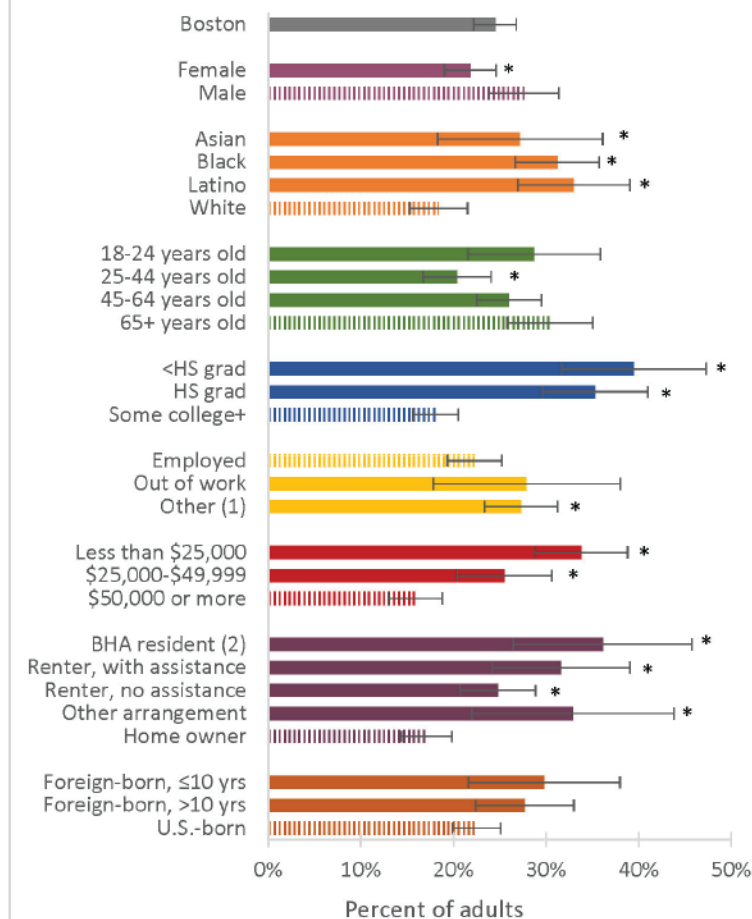
The percentage of adults who reported low vegetable consumption was higher for the following groups:

- Asian (27%), Black (31%), and Latino (33%) adults compared with White adults (18%)
- Adults who did not receive a high school diploma (39%) and adults who received a high school diploma (35%) compared with adults with some college education (18%)
- Adults whose employment status was "other" (27%) compared with adults who were employed (22%)
- Adults who lived in households with an income of less than \$25,000 (34%) and adults who lived in households with an income of \$25,000-\$49,999 (26%) compared with adults who lived in households with an income of \$50,000 or more (16%)
- Adults who were Boston Housing Authority residents (36%), adults who received rental assistance (32%), adults who rented but did not receive rental assistance (25%), and adults with other housing arrangements (33%) compared with adults who owned their home (17%)

The percentage of adults who reported low vegetable consumption was lower for the following groups:

- Females (22%) compared with males (28%)
- Adults ages 25-44 (20%) compared with adults ages 65 and older (30%)

Figure 7.12 Adults Who Consumed Vegetables Less Than Once per Day by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

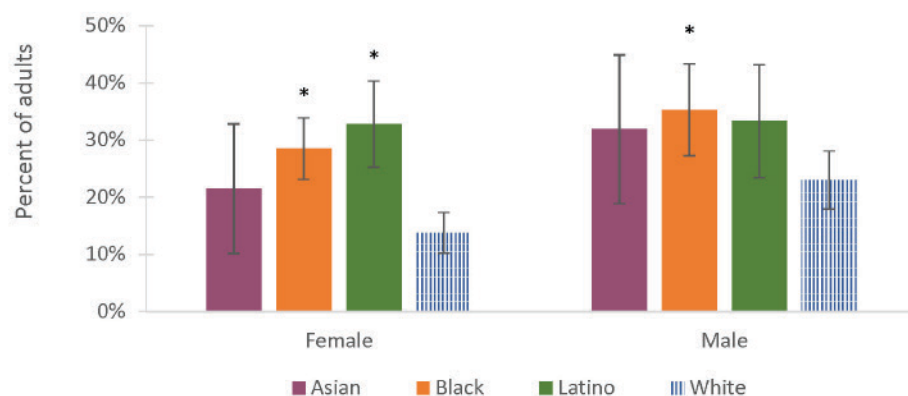
(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 7.13 Adults Who Consumed Vegetables Less Than Once per Day by Sex and Race/Ethnicity, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

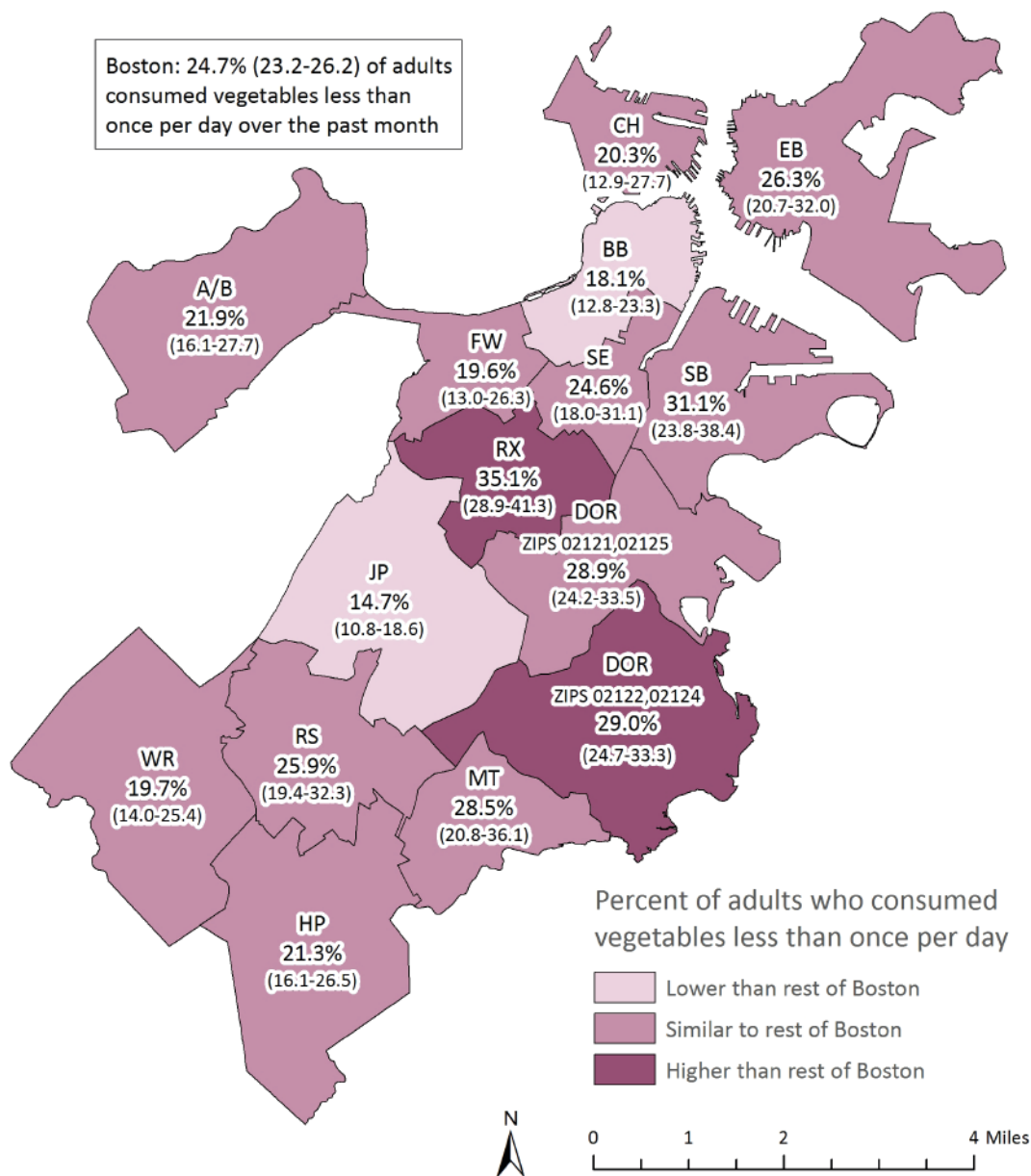
DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, higher percentages of Black (29%) and Latino (33%) female Boston adult residents reported consuming vegetables less than once per day over the past month compared with White female adults (14%).

A higher percentage of Black male adults (35%) reported low vegetable consumption compared with White male adults (23%).



Figure 7.14 Adults Who Consumed Vegetables Less Than Once per Day by Neighborhood, 2013 and 2015 Combined



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, higher percentages of adult residents in Dorchester (zip codes 02122, 02124) and Roxbury reported consuming vegetables less than once per day over the past month compared with the rest of Boston. Lower percentages of adults in the Back Bay and Jamaica Plain reported low vegetable consumption.

Physical Activity

Regular physical activity that includes both aerobic and muscle strengthening activities is important for a healthy lifestyle. It helps control weight, strengthens bones and muscles, improves mental health, and reduces the risk of chronic disease. According to the Centers for Disease Control and Prevention (CDC), children and adolescents need at least one hour of physical activity each day (13). The 2015 YRBSS indicates that approximately 49% of U.S. high school students reported daily physical activity of at least 60 minutes for at least 5 days of the past week, more so for male (58%) than female students (39%) (12). While aerobic activity should make up the bulk of those 60 minutes, muscle strengthening activities such as gymnastics or push-ups, and bone strengthening activities such as jumping rope or running, should be done at least three times a week as part of the 60 minutes of physical activity (14).

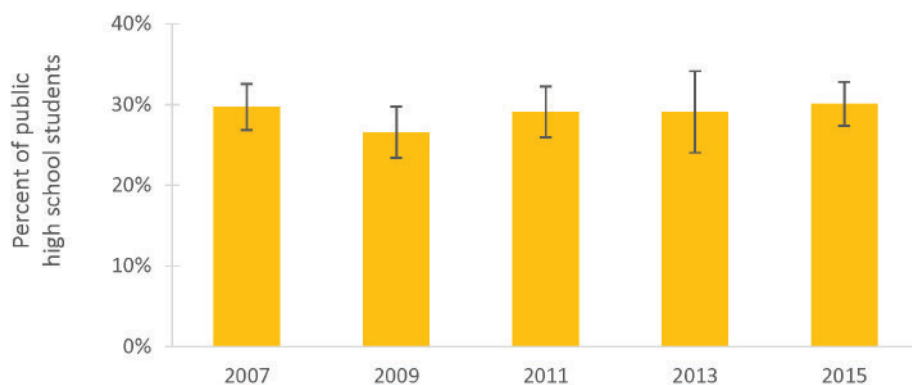
Adults require at least 150 minutes of moderate-intensity aerobic activity or 75 minutes of vigorous-intensity aerobic activity every week. Aerobic activities may be broken up into smaller increments of at least 10 minutes and spread out throughout the week. Additionally, muscle strengthening activities for all major muscle groups should be performed at least two days a week (15). These recommendations also apply to adults 65 and older who have no limiting health conditions (16). According to the 2015 Behavioral Risk Factor Surveillance System (BRFSS), approximately 20% of U.S. adults reported participation in aerobic and muscle strengthening exercises to meet these guidelines, with higher percentages generally observed in younger adults ages 18-24 and in men (11).

There are many ways to meet the minimum requirements
of maintaining a physically active lifestyle.

Moderate Activity	Vigorous Activity	Muscle Strengthening
Walking briskly	Race walking, jogging, or running	Lifting weights
Bicycling (< 10 mph)	Swimming laps	Using resistance bands
Water aerobics	Aerobic dancing	Heavy gardening (i.e., digging, shoveling)
Ballroom dancing	Bicycling (>10 mph)	Yoga
General gardening	Jumping rope	Push-ups, sit ups, etc.

In 2015, 30% of Boston public high school students reported regular physical activity (at least 60 minutes a day for at least 5 of the past 7 days). This percentage did not significantly change between 2007 and 2015.

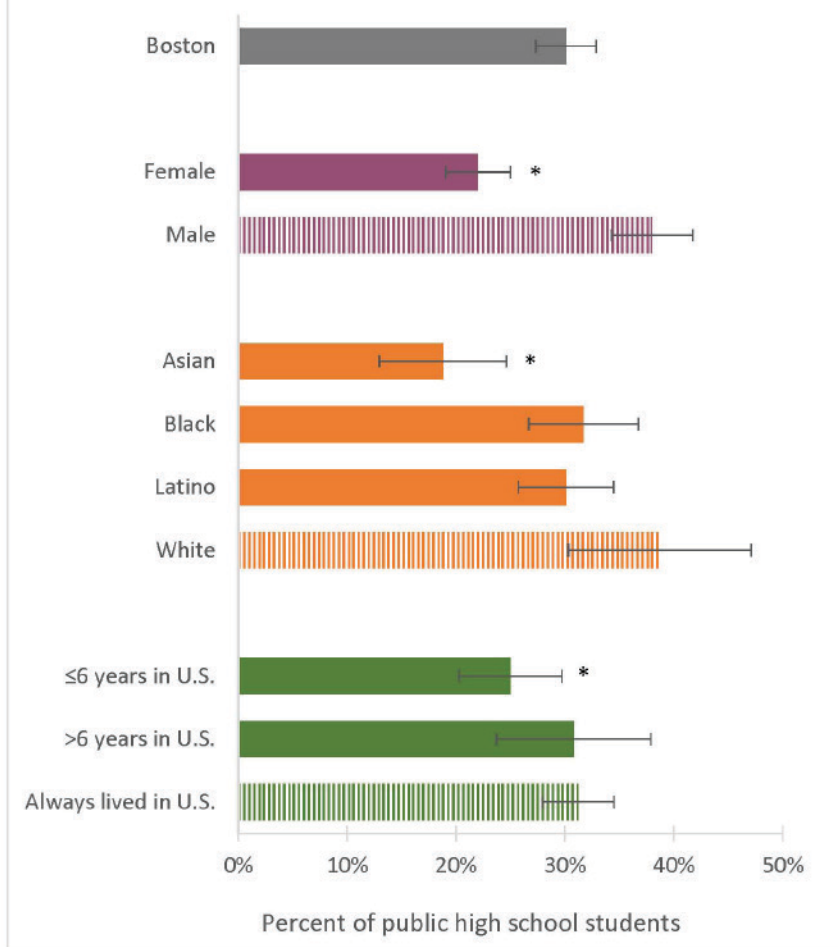
Figure 7.15 Public High School Students Who Engaged in Regular Physical Activity by Year



DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools



Figure 7.16 Public High School Students Who Engaged in Regular Physical Activity by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

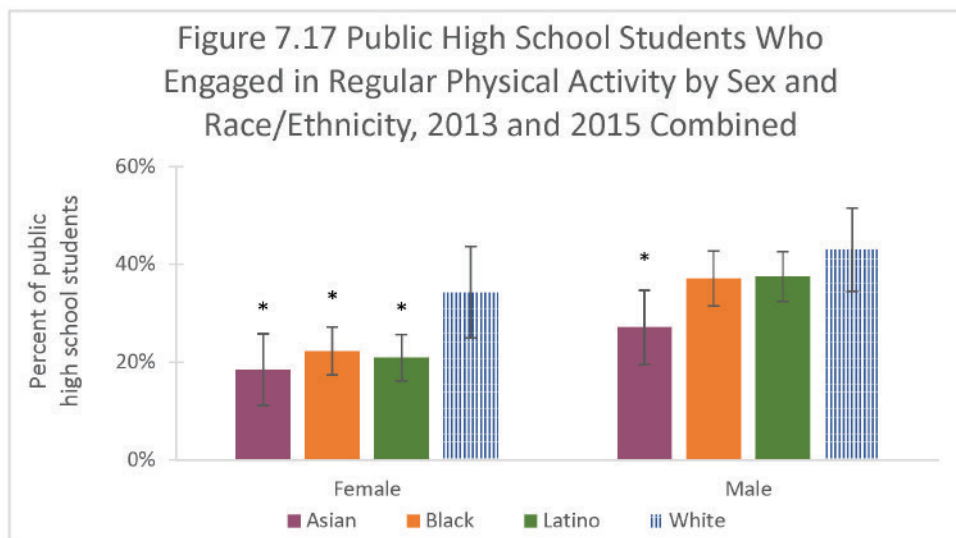
DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

In 2015, 30% of Boston public high school students reported regular physical activity (at least 60 minutes a day for at least 5 of the past 7 days). The percentage of students who reported regular physical activity was lower for the following groups:

- Female students (22%) compared with male students (38%)
- Asian students (19%) compared with White students (39%)
- Students who had lived in the United States for 6 years or fewer (25%) compared with students who had always lived in the United States (31%)

For 2013 and 2015 combined, lower percentages of Asian (19%), Black (22%), and Latino (21%) female Boston public high school students reported regular physical activity (at least 60 minutes a day for at least 5 of the past 7 days) compared with White female students (34%).

A lower percentage of Asian male students (27%) reported being physically active compared with White male students (43%).

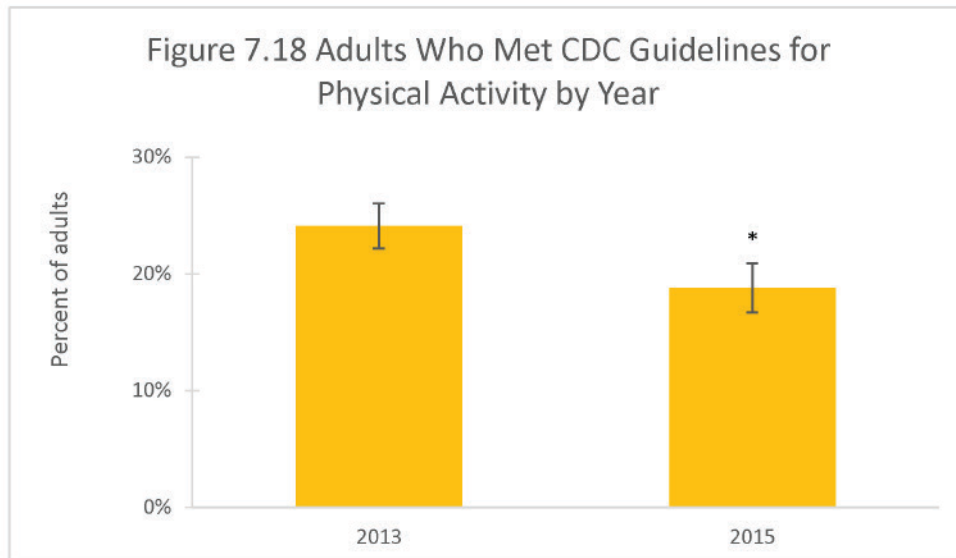


* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

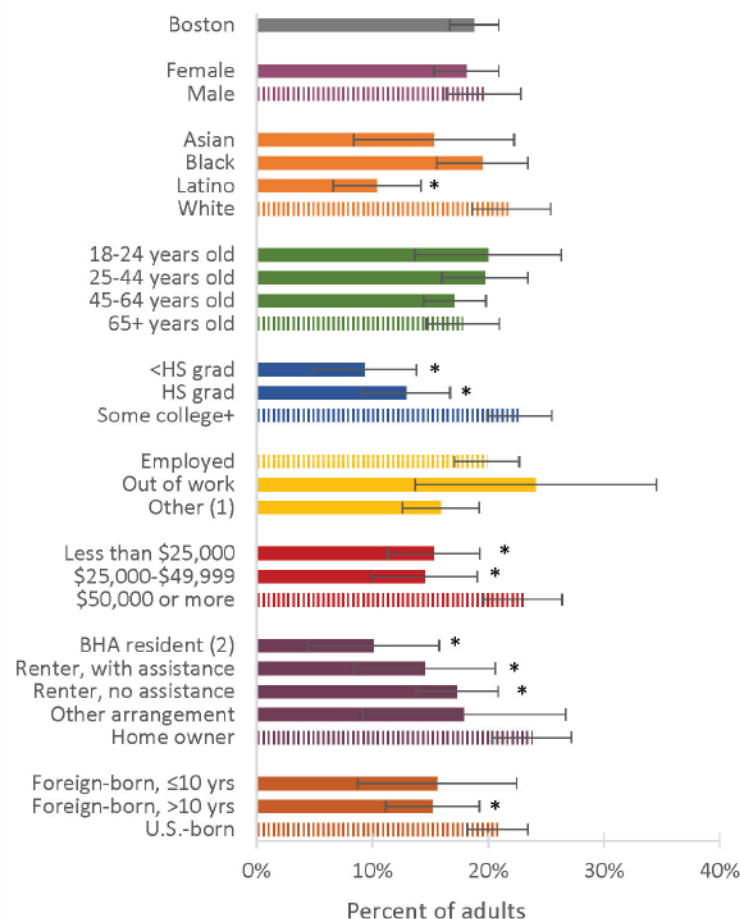
In 2015, 19% of Boston adult residents reported meeting CDC guidelines for physical activity over the past month. This decreased from 2013 to 2015.



* Statistically significant change over time

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

Figure 7.19 Adults Who Met CDC Guidelines for Physical Activity by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, 19% of Boston adult residents reported meeting CDC guidelines for physical activity over the past month.

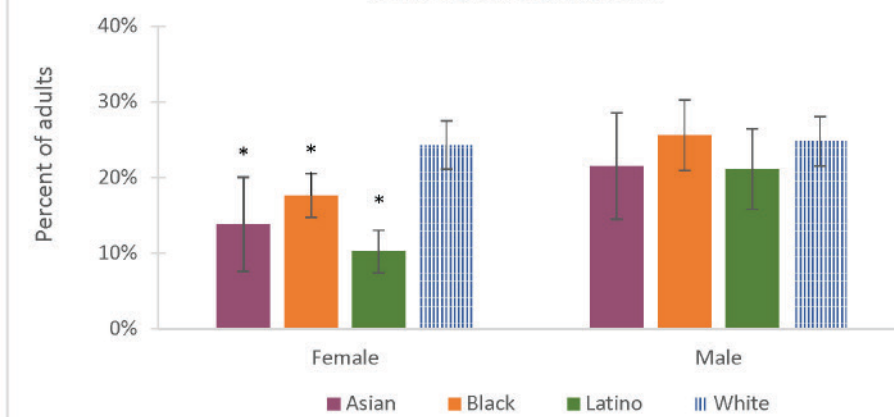
The percentage of adults who reported meeting CDC guidelines for physical activity was lower for the following groups:

- Latino adults (10%) compared with White adults (22%)
- Adults who did not receive a high school diploma (9%) and adults who received a high school diploma (13%) compared with adults with some college education (23%)
- Adults who lived in households with an income of less than \$25,000 (15%) and adults who lived in households with an income of \$25,000-\$49,999 (15%) compared with adults who lived in households with an income of \$50,000 or more (23%)
- Adults who were Boston Housing Authority residents (10%), adults who received rental assistance (14%), and adults who rented but did not receive rental assistance (17%) compared with adults who owned their home (24%)
- Foreign-born adults who lived in the United States for more than 10 years (15%) compared with adults who were born in the United States (21%)

For 2013 and 2015 combined, lower percentages of Asian (14%), Black (18%), and Latino (10%) female Boston adult residents reported meeting CDC guidelines for physical activity over the past month compared with White female adults (24%).

There were no significant differences for Asian, Black, and Latino male adults compared with White male adults.

Figure 7.20 Adults Who Met CDC Guidelines for Physical Activity by Sex and Race/Ethnicity, 2013 and 2015 Combined



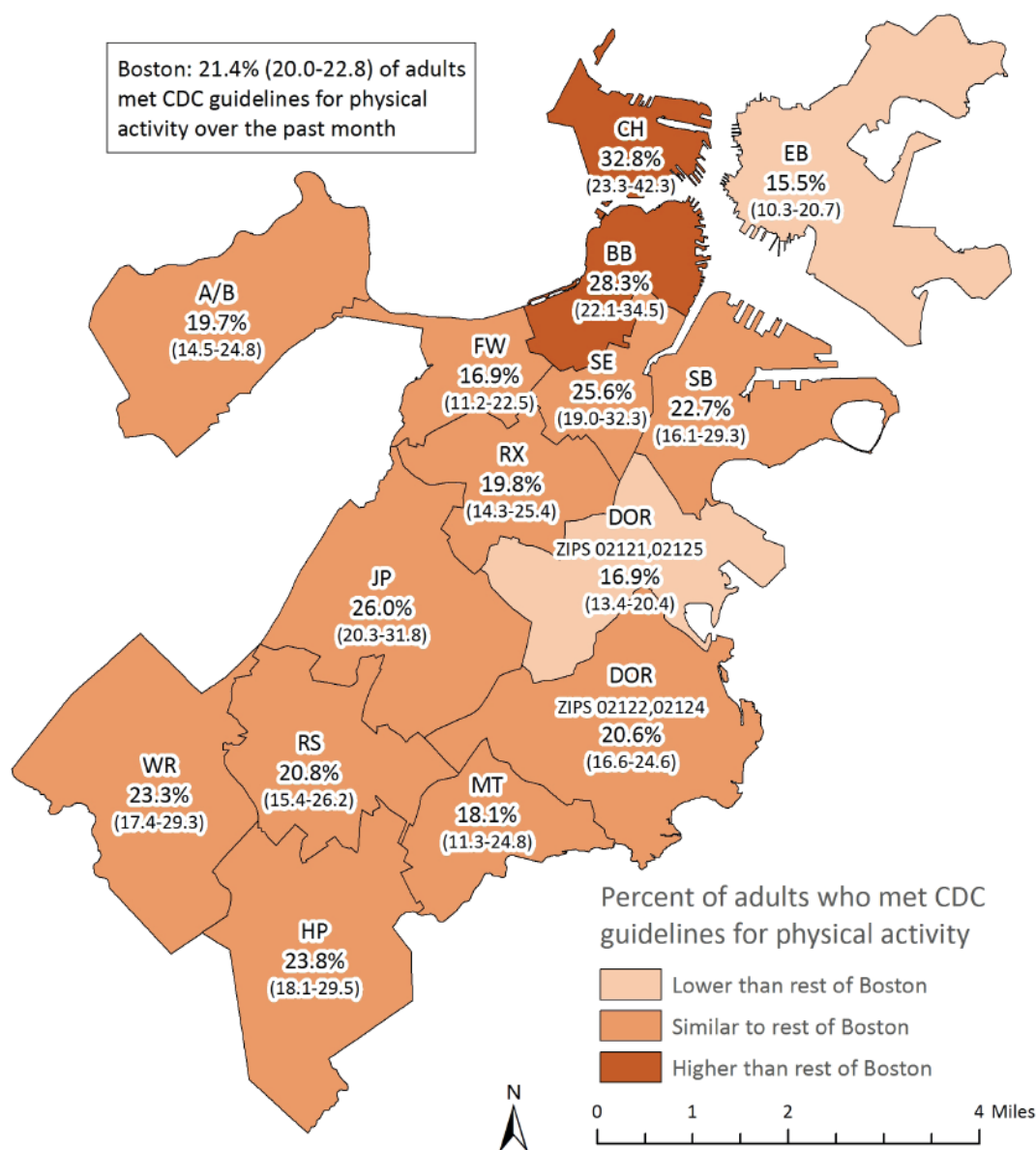
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission



Figure 7.21 Adults Who Met CDC Guidelines for Physical Activity by Neighborhood, 2013 and 2015 Combined



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, higher percentages of adult residents in Back Bay and Charlestown reported meeting CDC guidelines for physical activity over the past month compared with the rest of Boston. Lower percentages of adults in Dorchester (zip codes 02121, 02125) and East Boston reported meeting CDC guidelines for physical activity compared with the rest of Boston.

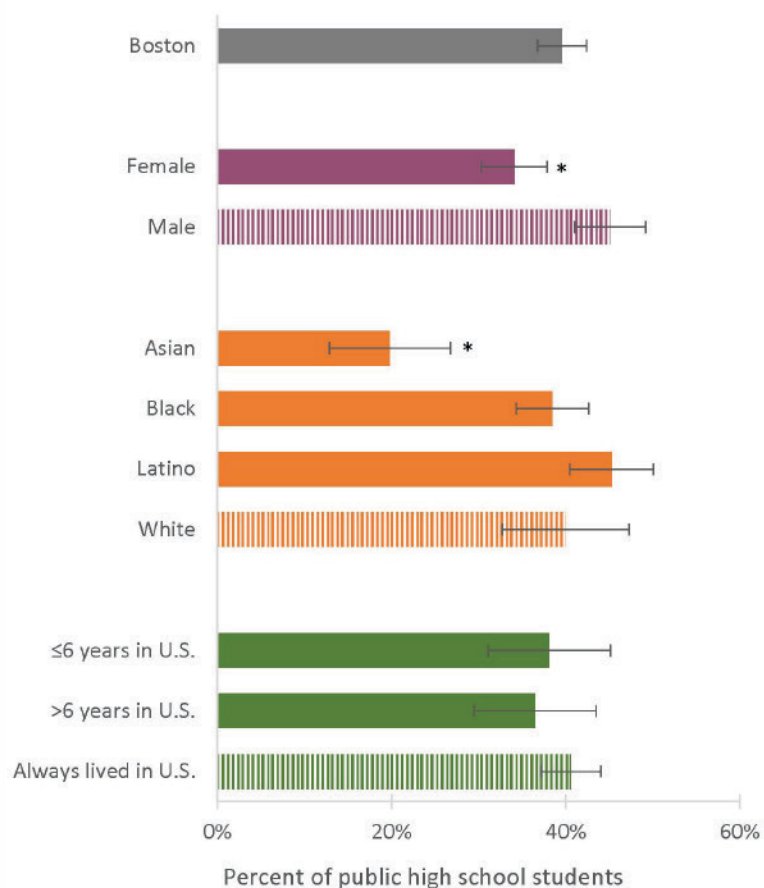
Sugar-Sweetened Beverages

Sugar-sweetened beverages (SSBs) are drinks with added sugar, including soft drinks (i.e. soda), fruit drinks or punches, sports drinks, tea and coffee drinks, energy drinks, and sweetened milks or milk alternatives (17). They are the largest source of empty calories for children and adolescents in the U.S. (18, 19). SSBs, which provide calories but lack nutritional value, are a major target in the fight to reduce obesity, especially among youth who consume 22% of their empty calories from SSBs (19). The CDC, the American Academy for Pediatrics, and the American Heart Association have all called for the reduced consumption of sugary drinks for health-related reasons including obesity, type 2 diabetes, and heart disease (19-21).

The percentage of U.S. adults who report having at least 1 SSB per day ranges from approximately 20% to 50% (22), with higher percentages observed in younger adults, men, Black residents, unemployed individuals, and individuals with less than a high school education (22). Sugar-sweetened beverage companies specifically target youth and youth of color to buy their products (23). The 2015 YRBSS indicates that approximately 20% of U.S. high school students reported having at least 1 soda per day, with a higher percentage observed in male than female students (12). The availability of SSBs for purchase within and in close proximity of schools may influence SSB consumption among children and adolescents (24, 25).



Figure 7.22 Daily Consumption of One or More Sugar-Sweetened Beverages Among Public High School Students by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

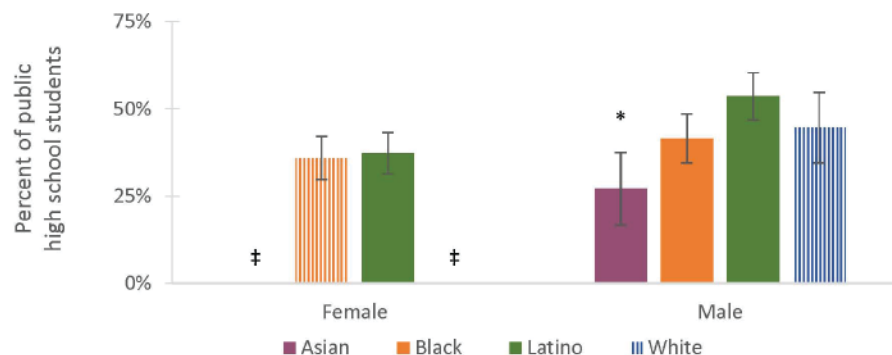
In 2015, 40% of Boston public high school students reported having one or more sugar-sweetened beverages daily over the past week.

A lower percentage of female students (34%) reported having one or more sugar-sweetened beverages compared with male students (45%). A lower percentage of Asian students (20%) reported having one or more sugar-sweetened beverages compared with White students (40%).

In 2015, there was no significant difference in the percentages of Black and Latino female Boston public high school students who reported having one or more sugar-sweetened beverages daily over the past week.

A lower percentage of Asian male students (27%) reported having one or more sugar-sweetened beverages compared with White male students (45%).

Figure 7.23 Daily Consumption of One or More Sugar-Sweetened Beverages Among Public High School Students by Sex and Race/Ethnicity, 2015



* Statistically significant difference when compared to reference group

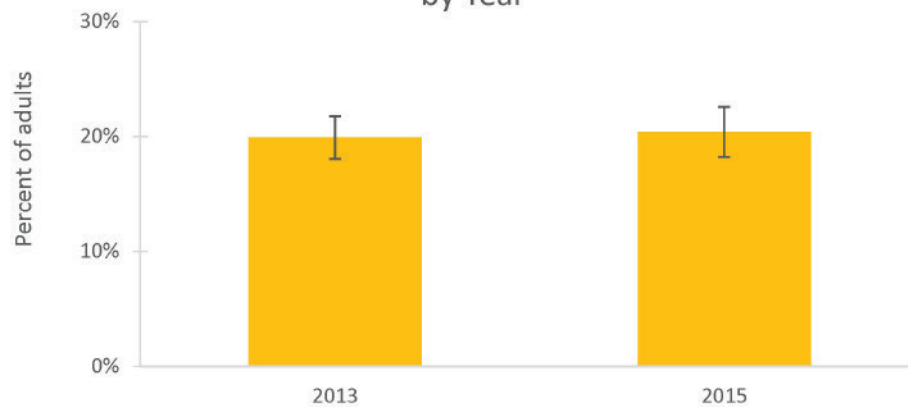
Data not presented due to insufficient sample size

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

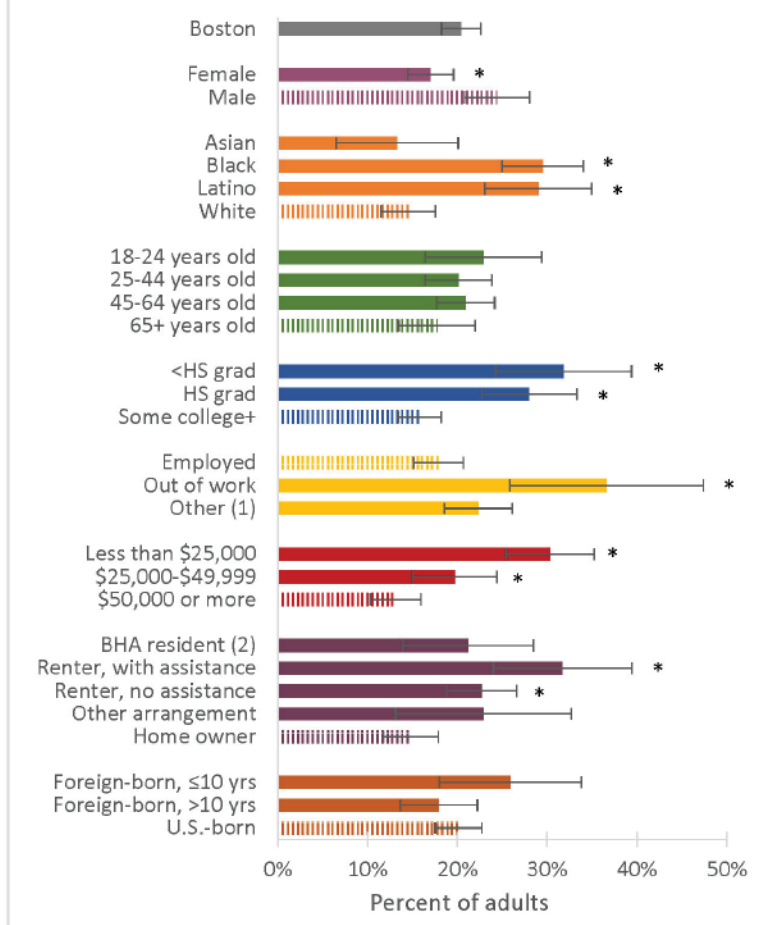
In 2015, 20% of Boston adult residents reported having one or more sugar-sweetened beverages daily over the past 30 days. There was no significant difference in this percentage between 2013 and 2015.

Figure 7.24 Daily Consumption of One or More Sugar-Sweetened Beverages Among Adults by Year



DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

Figure 7.25 Daily Consumption of One or More Sugar-Sweetened Beverages Among Adults by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, 20% of Boston adult residents reported having one or more sugar-sweetened beverages daily over the past 30 days.

The percentage of adults who reported having one or more sugar-sweetened beverages was higher for the following groups:

- Black (30%) and Latino (29%) adults compared with White adults (14%)
- Adults who did not receive a high school diploma (32%) and adults who received a high school diploma (28%) compared with adults with some college education (16%)
- Adults who were out of work (37%) compared with adults who were employed (18%)
- Adults who lived in households with an income of less than \$25,000 (30%) and adults who lived in households with an income of \$25,000-\$49,999 (20%) compared with adults who lived in households with an income of \$50,000 or more (13%)
- Adults who received rental assistance (32%) and adults who rented but did not receive rental assistance (23%) compared with adults who owned their homes (15%)

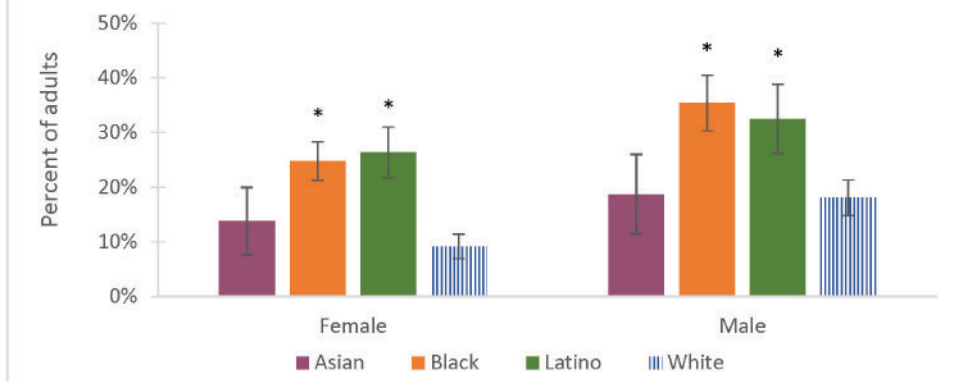
The percentage of adults who reported having one or more sugar-sweetened beverages was lower for the following group:

- Females (17%) compared with males (24%)

For 2013 and 2015 combined, higher percentages of Black (25%) and Latino (26%) female Boston adult residents reported having one or more sugar-sweetened beverages daily over the past 30 days compared with White female adults (9%).

Higher percentages of Black (35%) and Latino (32%) male adults reported having one or more sugar-sweetened beverages compared with White male adults (18%).

Figure 7.26 Daily Consumption of One or More Sugar-Sweetened Beverages Among Adults by Sex and Race/Ethnicity, 2013 and 2015 Combined



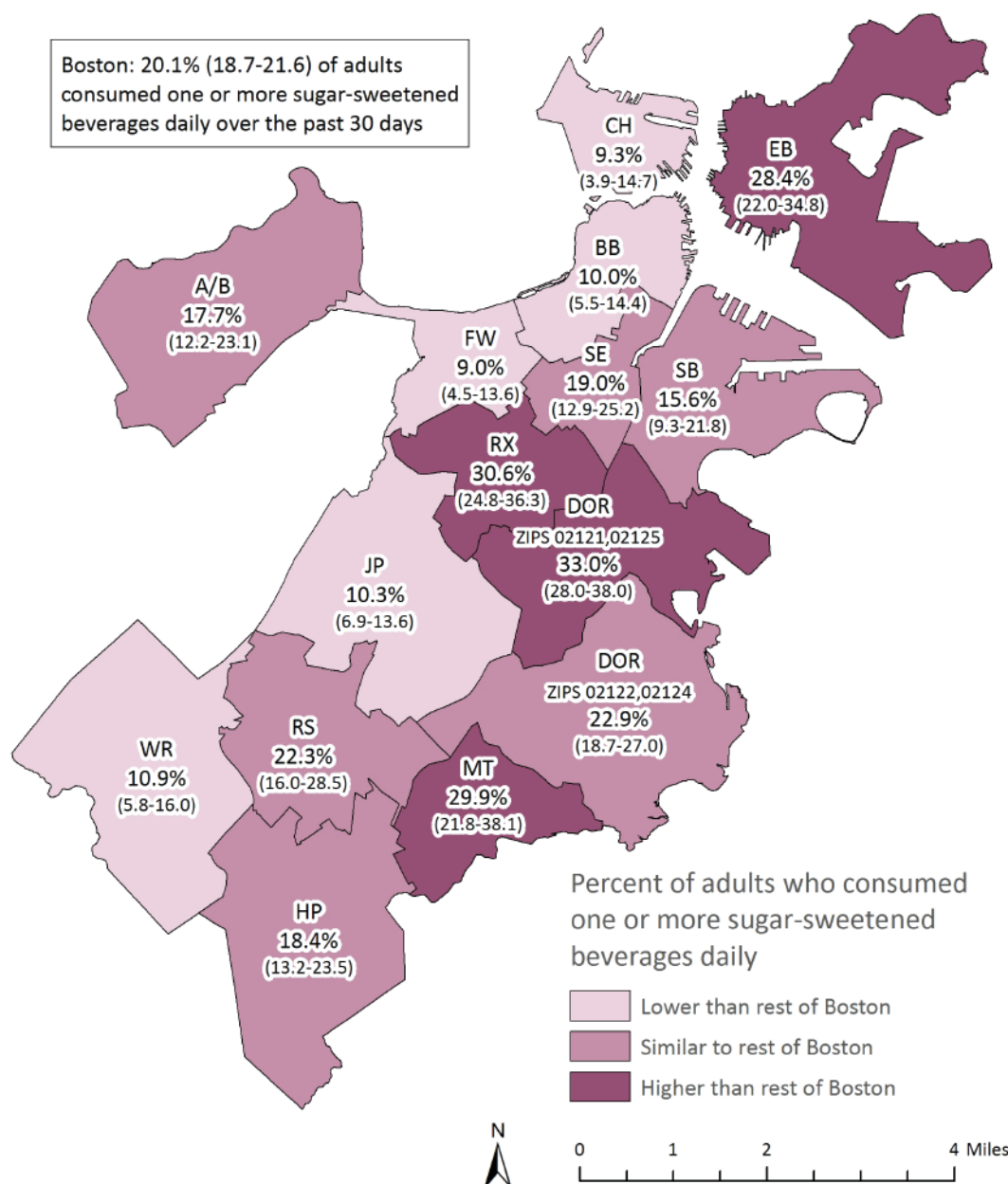
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission



Figure 7.27 Daily Consumption of One or More Sugar-Sweetened Beverages Among Adults by Neighborhood, 2013 and 2015 Combined



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, higher percentages of adult residents in Dorchester (zip codes 02121, 02125), East Boston, Mattapan, and Roxbury reported having one or more sugar-sweetened beverages daily over the past 30 days compared with the rest of Boston. Lower percentages of adults in Back Bay, Charlestown, Fenway, Jamaica Plain, and West Roxbury reported having one or more sugar-sweetened beverages compared with the rest of Boston.

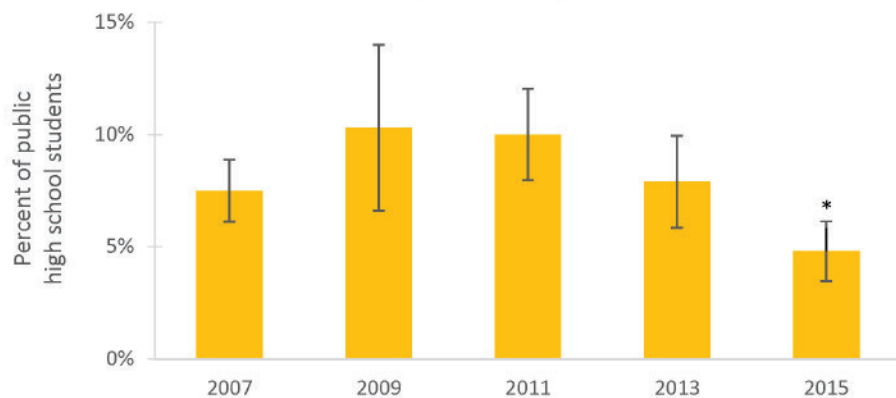
Smoking

Cigarette smoking is the leading preventable cause of death in the U.S., and is estimated to cause more than 480,000 deaths annually (26). Smoking negatively impacts almost every organ of the body, and the effects begin immediately upon inhalation. Within ten seconds, nicotine reaches the brain, inducing cigarette addiction. Soon after, cancer-causing agents (carcinogens) bind to cells in the lungs and other organs. Tobacco smoke damages blood vessels and increases the likelihood of blood clots. Carbon monoxide, another cigarette toxin, binds to red blood cells, preventing them from effectively circulating oxygen throughout the body (26). Long term damage from smoking includes chronic inflammation of the lungs, a weakened immune system, and DNA damage, all of which can lead to disease and death. The risk and severity of smoking-related illness depends on how long and how many cigarettes the smoker has smoked in his or her lifetime (27).

The 2015 BRFSS indicates that approximately 18% of U.S. adults currently smoke cigarettes (11). According to findings from the 2015 National Health Interview Survey, current cigarette smoking was highest among non-Latino American Indian/Alaska Native adults and people of multiple races, and lowest among Asian adults (28). Lesser educational attainment, lower household income, and blue-collar occupations are social determinants also shown to be associated with cigarette smoking in adults (28, 29). Observational studies in recent years also suggest that the social, economic, and physical attributes of neighborhoods where individuals live may also influence smoking behavior beyond individual choices (30, 31).

Despite the well known health risks, youth and young adult smoking rates in the U.S. have remained unchanged over the past few years (32); the percentage of current smokers among U.S. high school students and young adults ages 18 to 24 in 2015 was approximately 9% and 13%, respectively (12, 28). The reasons why smoking rates have remained unchanged in these subgroups are complex and relate to social and environmental factors that influence cigarette use as well as tobacco marketing tactics that entice young people, and specifically youth of color, to start smoking (33). Today, nearly all adults who smoke on a regular basis started before the age of 26, making adolescents and young adults a key demographic in reducing future smoking-related disease and death (32).

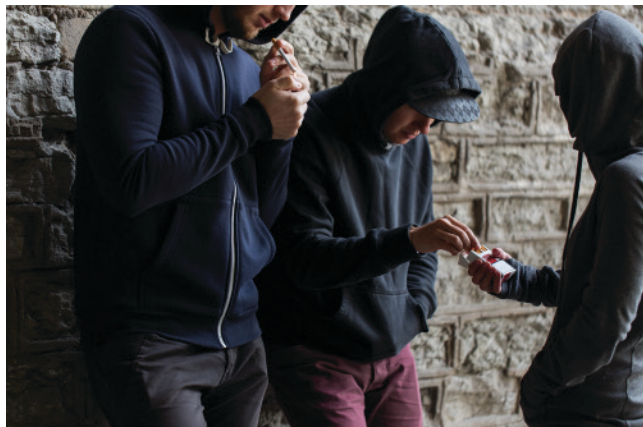
Figure 7.28 Public High School Students Who Smoked Cigarettes by Year



* Statistically significant change over time

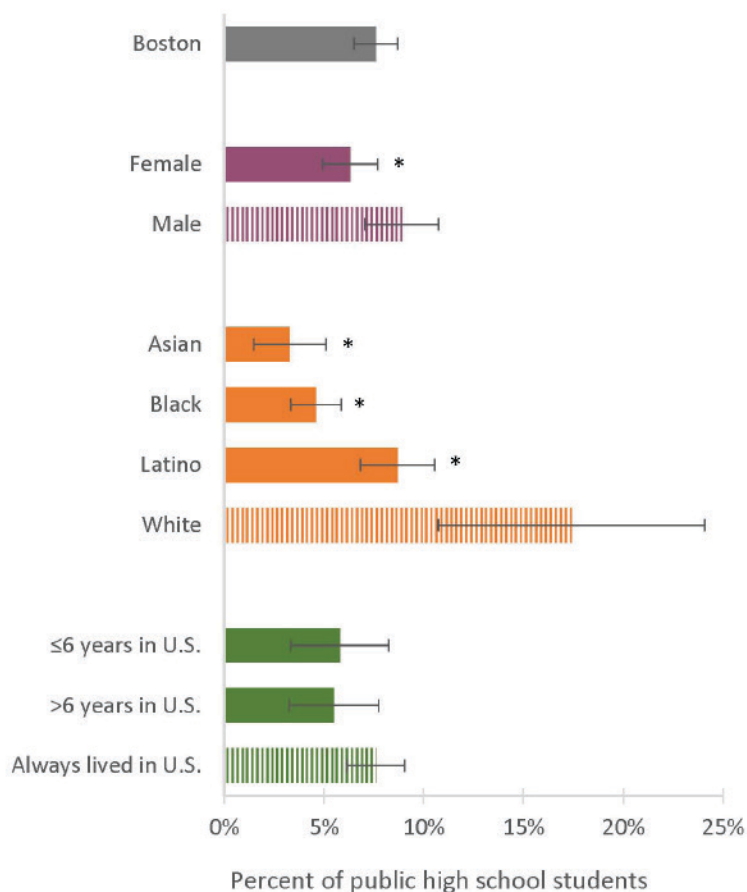
DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

In 2015, 5% of Boston public high school students reported having smoked cigarettes in the past 30 days. The percentage of students who reported smoking cigarettes decreased between 2007 and 2015.



For 2011, 2013, and 2015 combined, 8% of Boston public high school students reported having smoked cigarettes in the past 30 days. A lower percentage of female students (6%) reported smoking cigarettes compared with male students (9%). Lower percentages of Asian (3%), Black (5%), and Latino (9%) students reported smoking cigarettes compared with White students (17%).

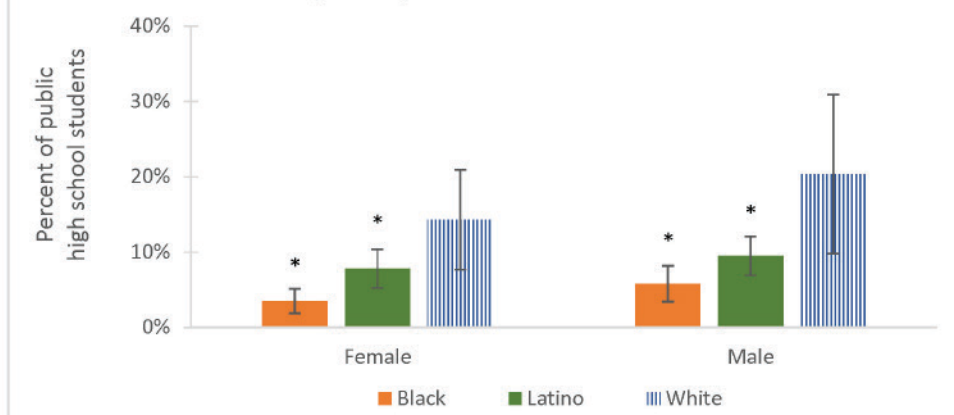
Figure 7.29 Public High School Students Who Smoked Cigarettes by Selected Indicators, 2011, 2013, and 2015 Combined



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.
DATA SOURCE: Youth Risk Behavior Survey (2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

Figure 7.30 Public High School Students Who Smoked Cigarettes by Sex and Race/Ethnicity, 2011, 2013, and 2015 Combined



* Statistically significant difference when compared to reference group

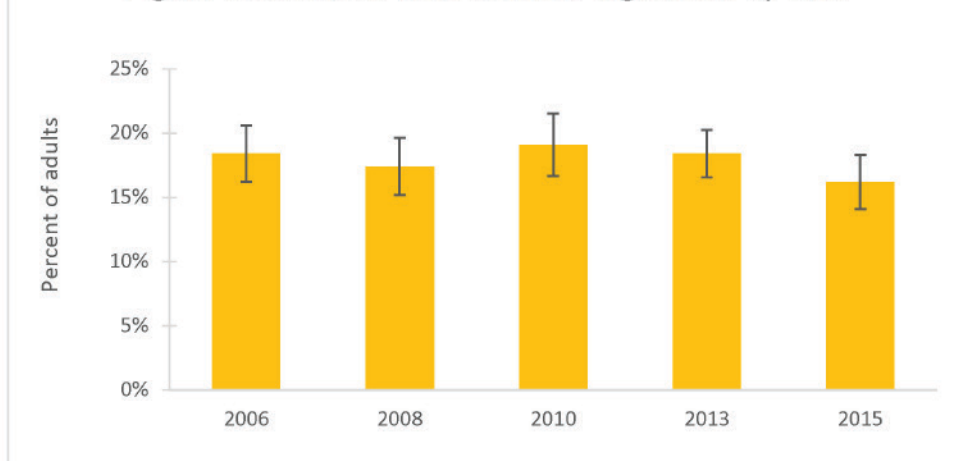
NOTE: Bars with patterns indicate the reference group within each selected indicator. Data not presented due to insufficient sample size for Asian female and male public high school students.

DATA SOURCE: Youth Risk Behavior Survey (2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

For 2011, 2013, and 2015 combined, lower percentages of Black (4%) and Latino (8%) female Boston public high school students reported having smoked cigarettes in the past 30 days compared with White female students (14%).

Lower percentages of Black (6%) and Latino (10%) male students reported having smoked cigarettes compared with White male students (20%).

Figure 7.31 Adults Who Smoked Cigarettes by Year



DATA SOURCE: Boston Behavioral Risk Factor Survey (2006, 2008, 2010, 2013, 2015), Boston Public Health Commission

In 2015, 16% of Boston adult residents reported smoking cigarettes every day or some days. This percentage did not change significantly between 2006 and 2015.

In 2015, 16% of Boston adult residents reported smoking cigarettes every day or some days.

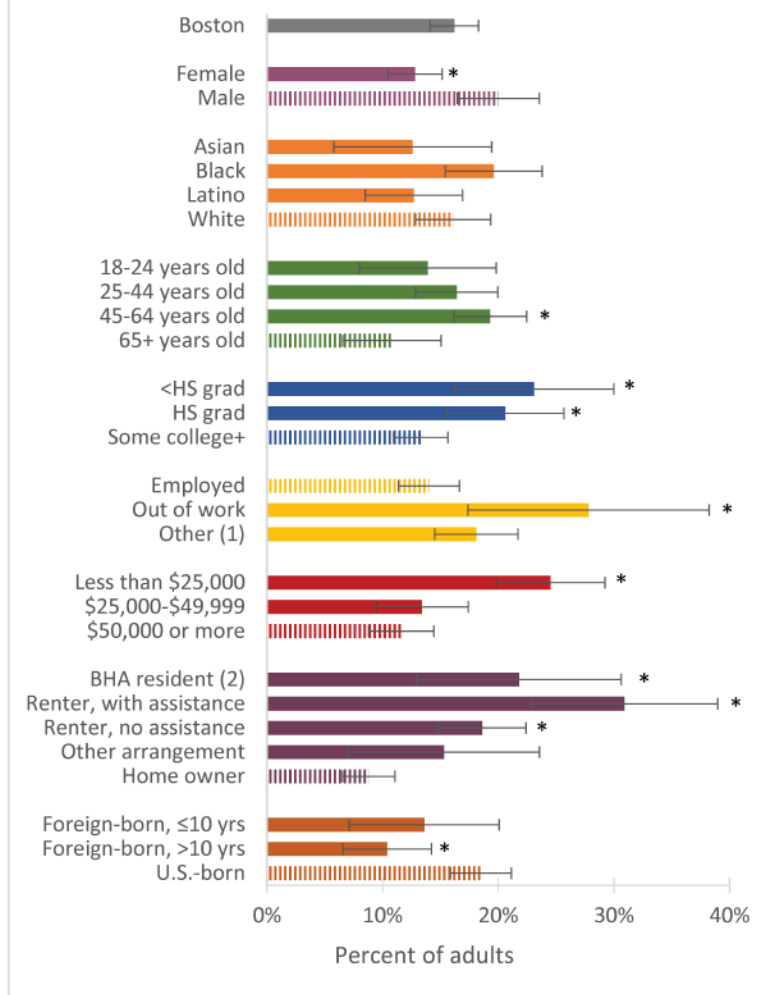
The percentage of adults who reported smoking cigarettes was higher for the following groups:

- Adults ages 45-64 (19%) compared with adults ages 65 and older (11%)
- Adults with less than a high school diploma (23%) and adults with a high school diploma (21%) compared with adults with some college education (13%)
- Adults who were out of work (28%) compared with adults who were employed (14%)
- Adults who lived in households with an income of less than \$25,000 (25%) compared with adults who lived in households with an income of \$50,000 or more (12%)
- Adults who were Boston Housing Authority residents (22%), who received rental assistance (31%), or who rented but did not receive rental assistance (19%) compared with adults who owned their home (9%)

The percentage of adults who reported smoking cigarettes was lower for the following groups:

- Females (13%) compared with males (20%)
- Foreign-born adults who had lived in the United States for more than 10 years (10%) compared with adults who were born in the United States (18%)

Figure 7.32 Adults Who Smoked Cigarettes by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

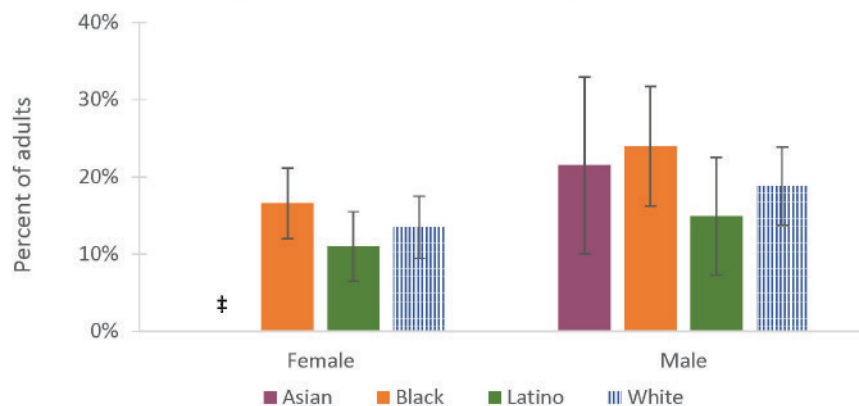
(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 7.33 Adults Who Smoked Cigarettes
by Sex and Race/Ethnicity, 2015



‡ Data not presented due to insufficient sample size

NOTE: Bars with patterns indicate the reference group for statistical testing within each selected indicator.

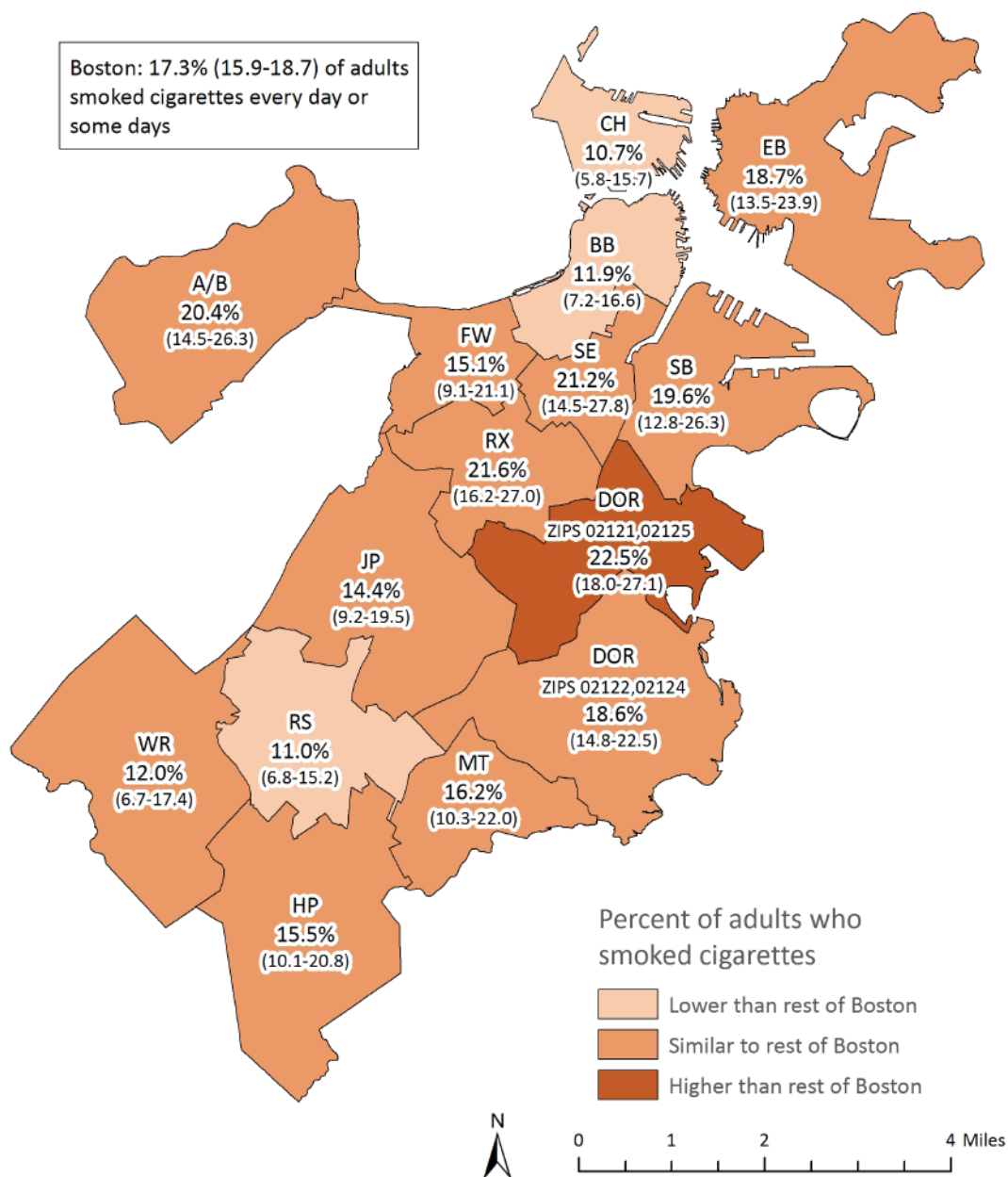
DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, there were no significant differences in the percentages of Black and Latino female Boston adult residents who reported smoking cigarettes every day or some days compared with White female adults.

Also, there were no significant differences for Asian, Black, and Latino male adults compared with White male adults.



Figure 7.34 Adults Who Smoked Cigarettes by Neighborhood, 2013 and 2015 Combined



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, a higher percentage of adult residents in Dorchester (zip codes 02121, 02125) reported smoking cigarettes every day or some days compared with the rest of Boston. Lower percentages of adults in Back Bay, Charlestown, and Roslindale reported smoking cigarettes compared with the rest of Boston.

Alcohol

Alcohol is the most commonly used drug nationally (34), and it is estimated that a little more than half of U.S. adults currently drink alcohol (11). While it is often considered socially acceptable to drink alcohol, excessive consumption can have negative effects ranging from poor judgment to increased risk of disease and death. The excessive use of alcohol significantly affects U.S. economic costs related to health care, crime, and morbidity-associated productivity. Binge drinking, a form of excessive alcohol use, accounts for three-fourths of these costs (35, 36).

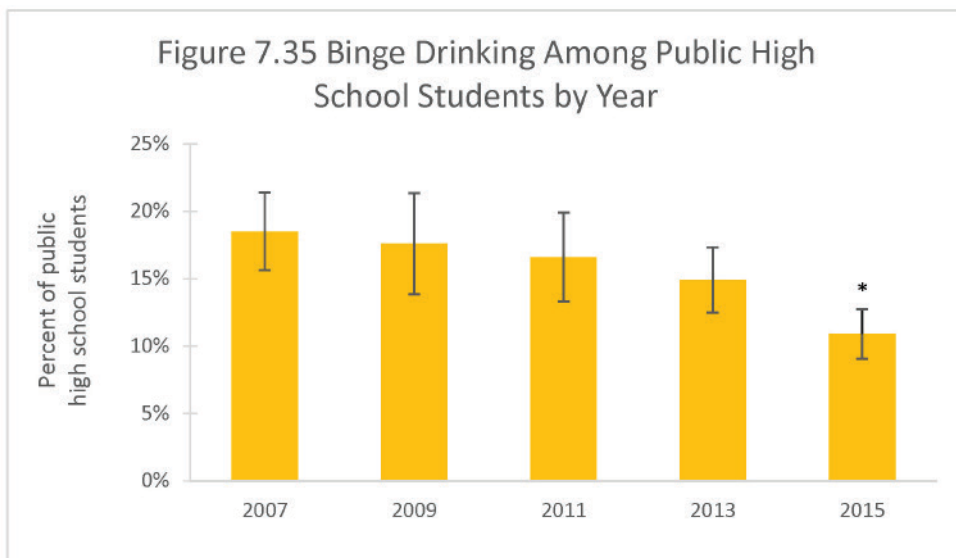
Binge drinking is defined as a pattern of alcohol consumption that brings the blood alcohol concentration level to 0.08% or more. It usually corresponds to 5 or more drinks for men and 4 or more drinks for women on a single occasion, generally within 2 hours. According to the 2015 BRFSS approximately 16% of U.S. adults reported recent binge drinking, with higher percentages generally observed in 18-24 and 25-34 -year-olds and in men (11).

Because the brain is not fully developed until roughly the age of 25, young people who binge drink are at a greater risk for permanent brain damage due to the toxic effects of alcohol (37). According to the 2015 YRBSS, approximately 18% of U.S. high school students reported recent binge drinking (12). Research suggests that youth binge drinking increases the risk of alcohol misuse or alcoholism later in life (38-40). Alcohol misuse is a pattern of drinking which results in harm to one's health, interpersonal relationships, or ability to work. Alcoholism is a chronic disease characterized by a strong craving for alcohol and the inability to limit drinking despite repeated physical, psychological, or interpersonal problems (41).

To reduce the risks associated with alcohol use, consumption should be moderated if not eliminated. Moderate drinking is defined as one drink per day for women and up to two drinks per day for men. Moderate alcohol consumption is associated with a lower risk of cardiovascular disease and all-cause mortality (10). No one should begin drinking or drink more frequently on the basis of potential health benefits because moderate alcohol intake is also associated with increased risk of cancers, violence, drowning, and injuries (10).



In 2015, 11% of Boston public high school students reported having 5 or more drinks of alcohol within a couple of hours at least once in the past 30 days. The percentage of students who reported binge drinking decreased between 2007 and 2015.

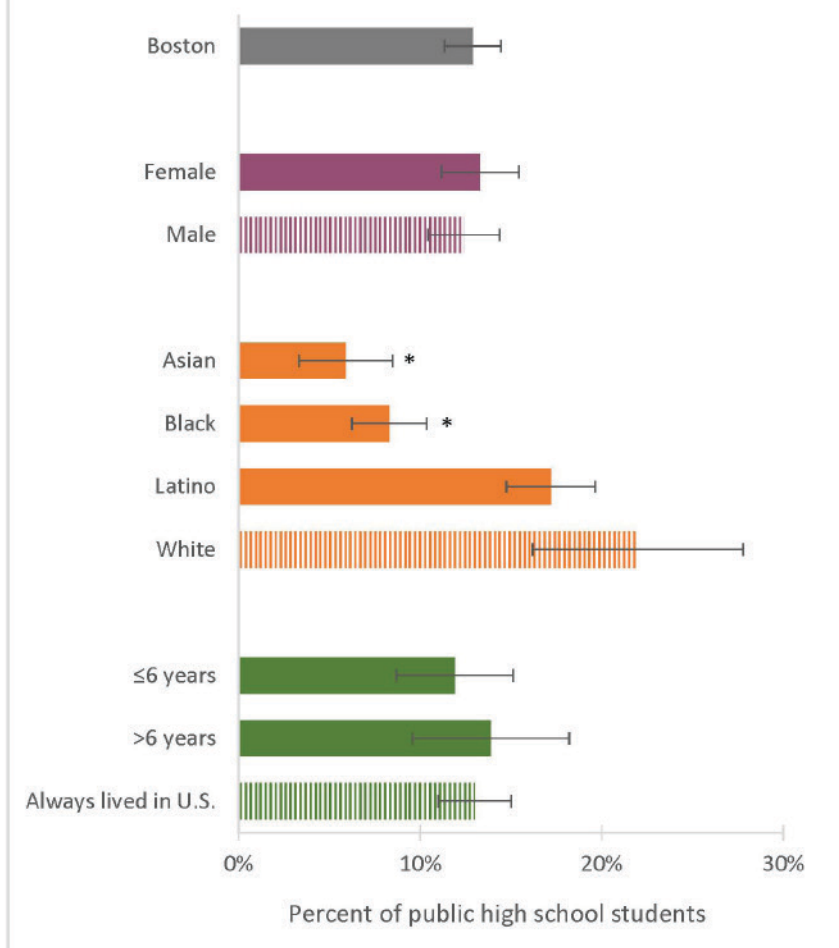


* Statistically significant change over time

DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools



Figure 7.36 Binge Drinking Among Public High School Students by Selected Indicators, 2013 and 2015 Combined



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

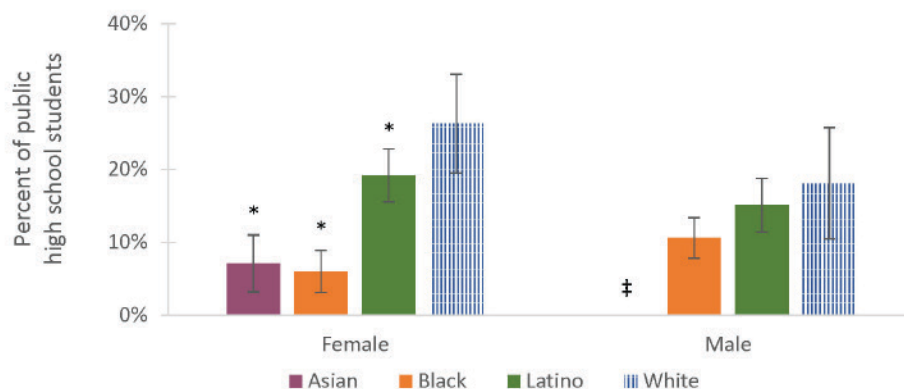
For 2013 and 2015 combined, 13% of Boston public high school students reported having 5 or more drinks of alcohol within a couple of hours at least once in the past 30 days.

Lower percentages of Asian (6%) and Black (8%) students reported binge drinking compared with White students (22%).

For 2013 and 2015 combined, lower percentages of Asian (7%), Black (6%), and Latino (19%) female Boston public high school students reported having 5 or more drinks of alcohol within a couple of hours at least once in the past 30 days compared with White female students (26%).

There were no significant differences for Black and Latino male students compared with White male students.

Figure 7.37 Binge Drinking Among Public High School Students by Sex and Race/Ethnicity, 2013 and 2015 Combined



* Statistically significant difference when compared to reference group

‡ Data not presented due to insufficient sample size

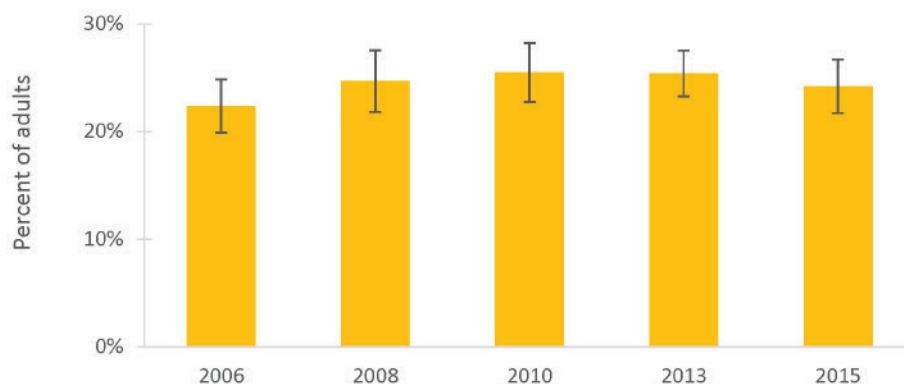
NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

In 2015, 24% of Boston adult residents reported binge drinking at least once in the past 30 days. The percentage of adults who reported binge drinking did not change between 2006 and 2015.

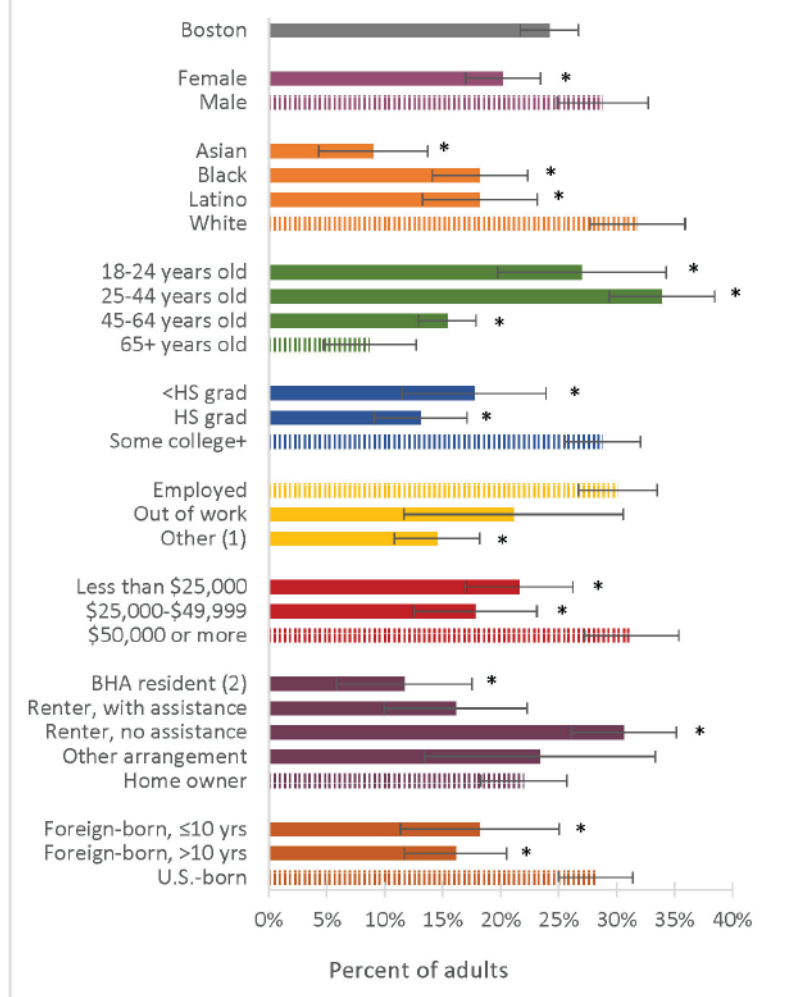
Binge drinking is defined as having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women.

Figure 7.38 Binge Drinking Among Adults by Year



DATA SOURCE: Boston Behavioral Risk Factor Survey (2006, 2008, 2010, 2013, 2015), Boston Public Health Commission

Figure 7.39 Binge Drinking Among Adults by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

(1) Includes homemakers, students, retirees, and those unable to work

(2) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, 24% of Boston adult residents reported binge drinking at least once in the past 30 days. Binge drinking is defined as having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women.

The percentage of adults who reported binge drinking was higher for the following groups:

- Adults ages 18-24 (27%), 25-44 (34%), or 45-64 (15%) compared with adults ages 65 and older (9%)
- Adults who rented but did not receive rental assistance (31%) compared with adults who owned their home (22%)

The percentage of adults who reported binge drinking was lower for the following groups:

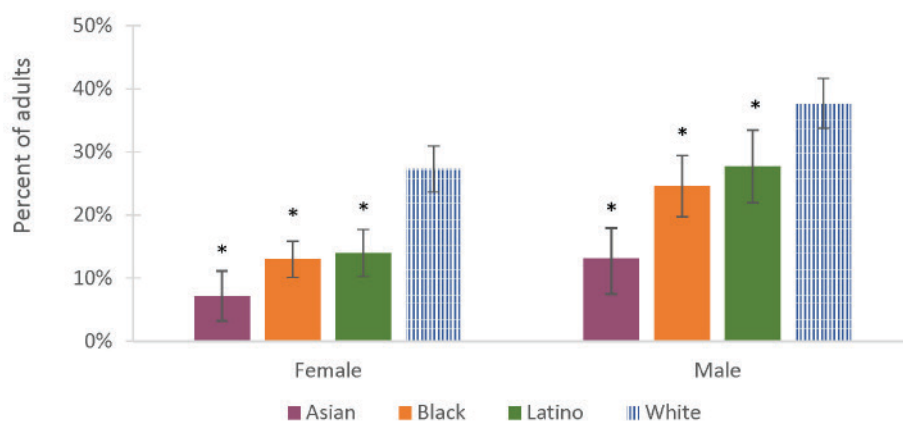
- Females (20%) compared with males (29%)
- Asian (9%), Black (18%), and Latino (18%) adults compared with White adults (32%)
- Adults who did not receive a high school diploma (18%) and adults who received a high school diploma (13%) compared with adults with some college education (29%)
- Adults whose employment status was "other" (15%) compared with adults who were employed (30%)
- Adults who lived in households with an income of less than \$25,000 (22%) and adults who lived in households with an income of \$25,000-\$49,999 (18%) compared with adults who lived in households with an income of \$50,000 or more (31%)
- Adults who were Boston Housing Authority residents (12%) compared with adults who owned their home (22%)
- Foreign-born adults who have lived in the United States for 10 years or fewer (18%) and foreign-born adults who have lived in the United States for more than 10 years (16%) compared with adults who were born in the United States (28%)

For 2013 and 2015 combined, lower percentages of Asian (7%), Black (13%), and Latino (14%) female Boston adult residents reported binge drinking at least once in the past 30 days compared with White female adults (27%).

Lower percentages of Asian (13%), Black (25%), and Latino (28%) male adults reported binge drinking compared with White male adults (38%).

Binge drinking is defined as having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women.

Figure 7.40 Binge Drinking Among Adults by Sex and Race/Ethnicity, 2013 and 2015 Combined



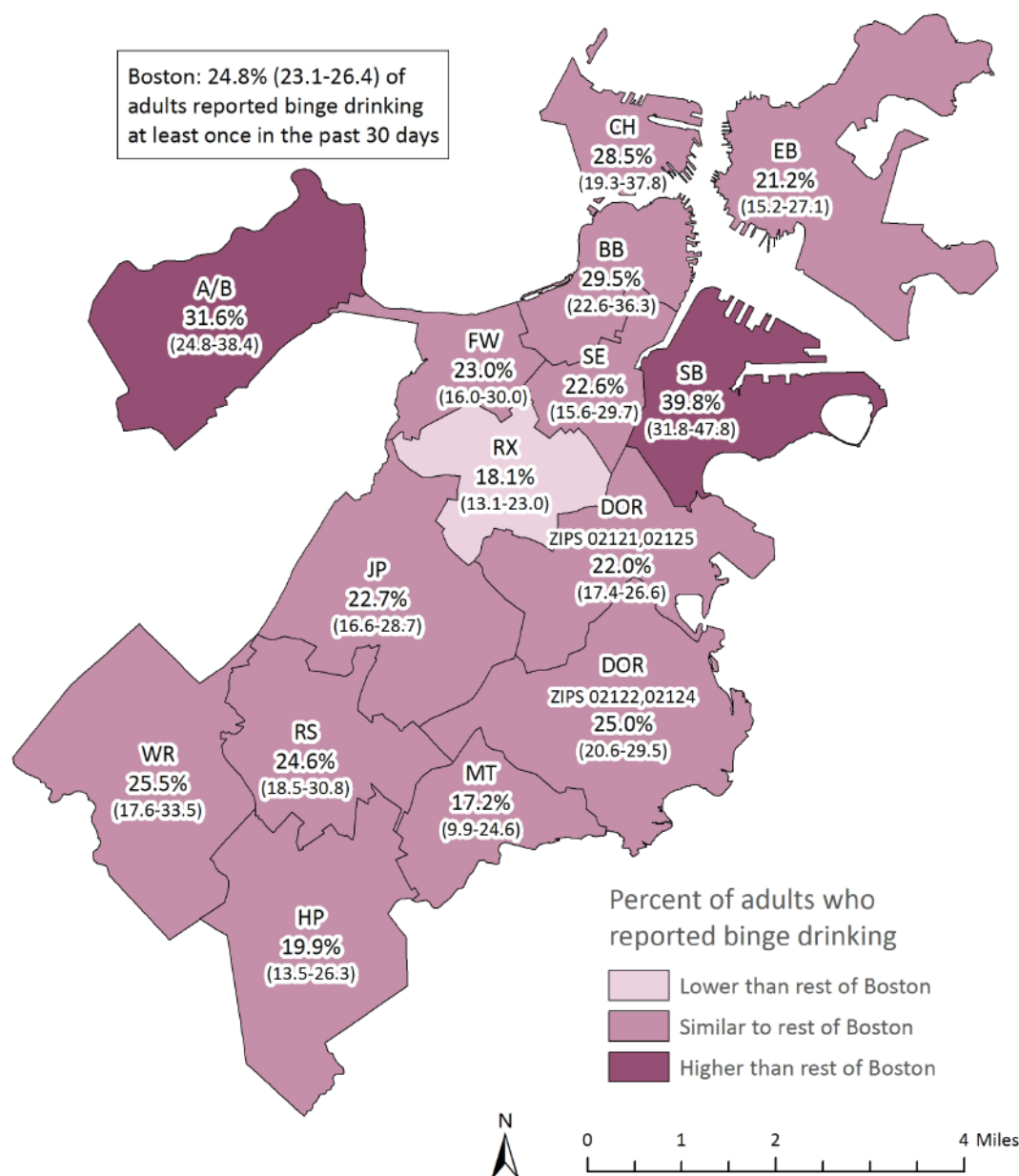
* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission



Figure 7.41 Binge Drinking Among Adults by Neighborhood, 2013 and 2015 Combined



NOTE: "BB" includes the Back Bay, Beacon Hill, Downtown, the North End, and the West End.
 "SE" includes the South End and Chinatown.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2013, 2015), Boston Public Health Commission

For 2013 and 2015 combined, higher percentages of adult residents in Allston/Brighton and South Boston reported binge drinking at least once in the past 30 days compared with the rest of Boston. A lower percentage of adults in Roxbury reported binge drinking compared with the rest of Boston. Binge drinking is defined as having 5 or more drinks on an occasion for men or 4 or more drinks on an occasion for women.

Marijuana

Legalization

Marijuana is a widely used drug in the U.S., with over 22 million users (42). For decades marijuana was an illegal drug. However, 29 states and the District of Columbia have legalized marijuana in some form (medical form or decriminalization) (43). The laws in 7 states – including Massachusetts – and the District of Columbia legalized marijuana for recreational use (43). Massachusetts voters first approved legalizing the use of marijuana for medical purposes through a ballot question in 2012. The law allows individuals who are certified by their physician as having a debilitating medical condition to use and possess up to a 60-day supply of medical marijuana. To register, a patient must obtain a letter from his/her physician and apply to the Massachusetts Department of Public Health. Then in 2016, Massachusetts voters approved a ballot question legalizing marijuana for recreational and commercial use (44).

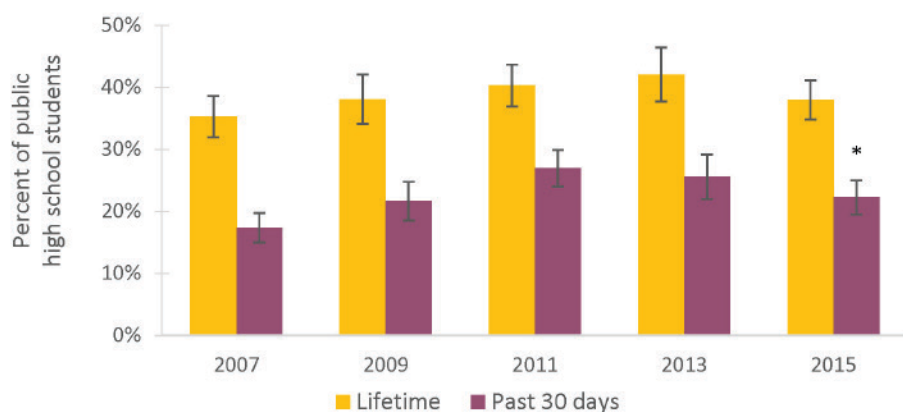
National data

According to the 2015 YRBSS, approximately 39% of U.S. high school students reported having ever used marijuana, and 22% reported marijuana use at least once in the past 30 days (12); similar percentages were observed for having ever used marijuana (41%) and for marijuana use at least once in the past 30 days (25%) among Massachusetts high school students (12). Current marijuana use is higher among Black than White students and higher among 12th grade than 9th grade students (12). The 2015 National Survey on Drug Use and Health estimates that approximately 32% and 10% of adults ages 18-25 years and 26 years and older, respectively, reported marijuana use in the past year (45).

Health effects

Although fewer people perceive that there are health risks associated with smoking marijuana in recent years (46), there is strong evidence from research linking marijuana use with addiction, increased risk of psychosis or schizophrenia, respiratory problems, and negative cognitive development (47). There is also limited evidence linking marijuana use with increased risk of motor vehicle crashes, cancer, cardiovascular disease, and lower IQ and academic/career success (46).

7.42 Lifetime and Past-30-Day Marijuana Use Among Public High School Students by Year



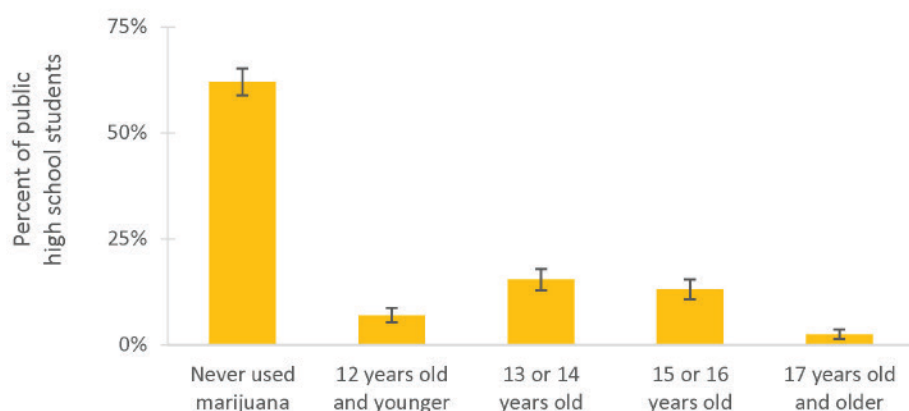
* Statistically significant change over time

DATA SOURCE: Youth Risk Behavior Survey (2007, 2009, 2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

In 2015, 38% of Boston public high school students reported having ever used marijuana in their lifetime. The percentage of students who reported having ever used marijuana did not change between 2007 and 2015.

Also, in 2015, 22% of students reported having used marijuana in the past 30 days. The percentage of students who reported having used marijuana in the past 30 days increased between 2007 and 2015.

Figure 7.43 Age of First-Time Marijuana Use Among Public High School Students, 2015



DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

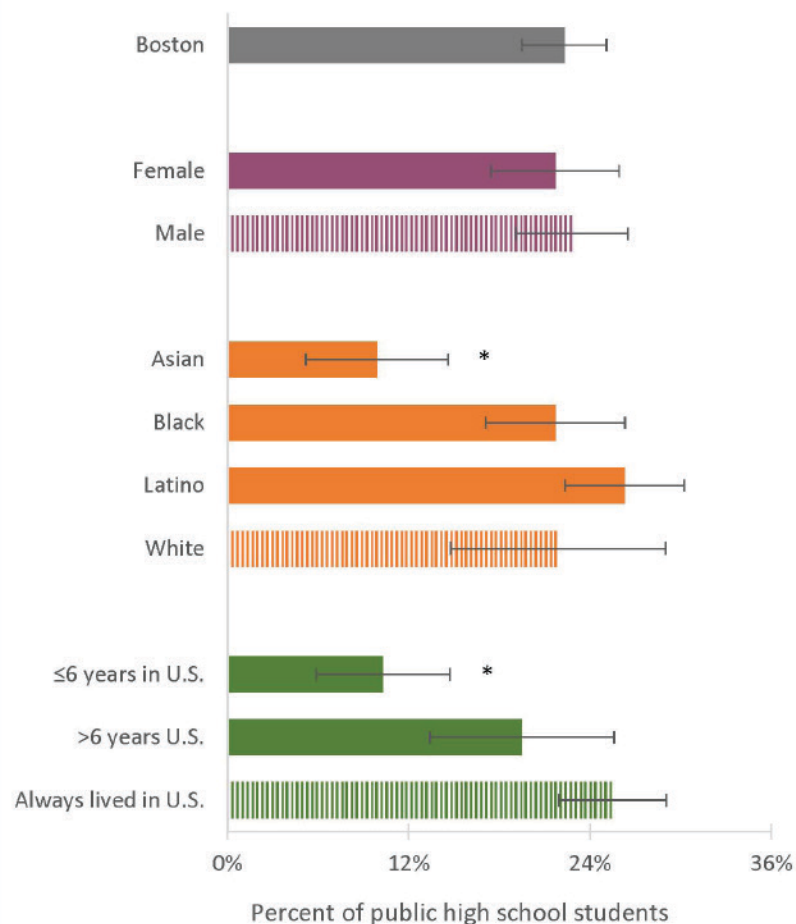
In 2015, 62% of Boston public high school students reported never having used marijuana. Fifteen percent and 13% of students reported having used marijuana for the first time at ages 13 or 14 and ages 15 or 16, respectively. Seven percent of students reported having used marijuana for the first time at ages 12 or younger, while 3% of students reported having used marijuana for the first time at ages 17 or older.

In 2015, 22% of Boston public high school students reported having used marijuana in the past 30 days.

A lower percentage of Asian students (10%) reported using marijuana compared with White students (22%).

A lower percentage of students who had lived in the United States for 6 years or fewer (10%) reported using marijuana compared with students who had always lived in the United States (25%).

Figure 7.44 Marijuana Use in the Past 30 Days Among Public High School Students by Selected Indicators, 2015

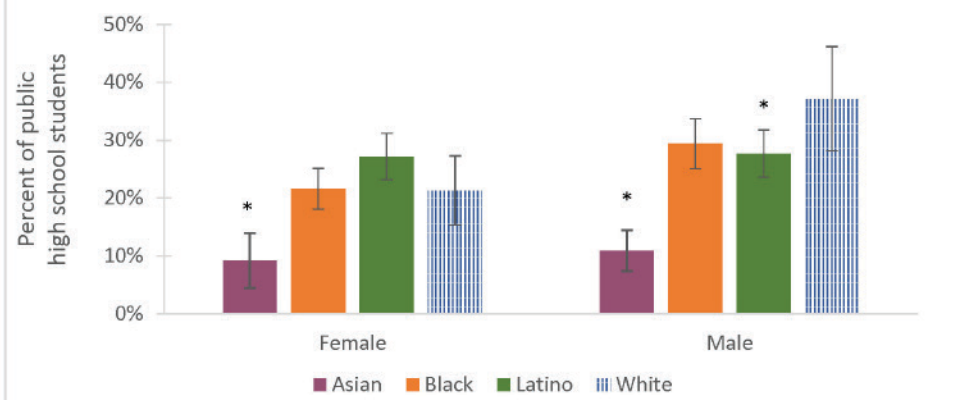


* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2015), Centers for Disease Control and Prevention and Boston Public Schools

Figure 7.45 Marijuana Use in the Past 30 Days Among Public High School Students by Sex and Race/Ethnicity, 2011, 2013, and 2015 Combined



* Statistically significant difference when compared to reference group

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Youth Risk Behavior Survey (2011, 2013, 2015), Centers for Disease Control and Prevention and Boston Public Schools

For 2011, 2013, and 2015 combined, a lower percentage of Asian female Boston public high school students (9%) reported having used marijuana in the past 30 days compared with White female students (21%).

Lower percentages of Asian (11%) and Latino (28%) male students reported having used marijuana compared with White male students (37%).



In 2015, 14% of Boston adult residents reported having used marijuana, hashish, or products that contain tetrahydrocannabinol (THC), the active ingredient in marijuana, in the past year.

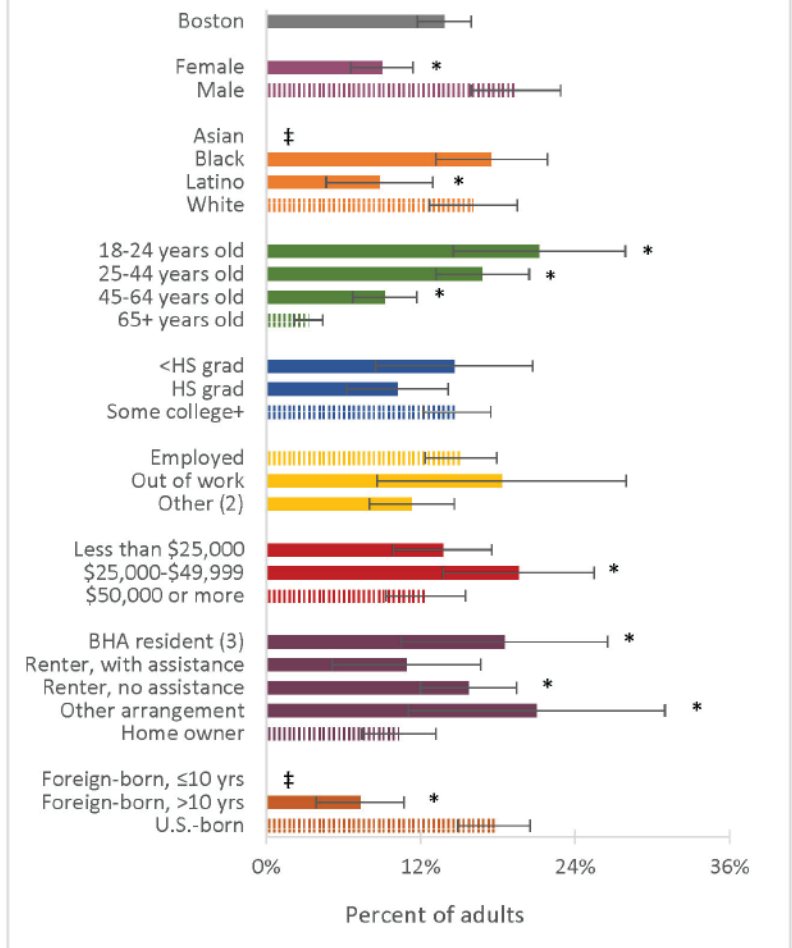
The percentage of adults who reported having used marijuana, hashish, or products that contain THC was higher for the following groups:

- Adults ages 18-24 (21%), 25-44 (17%), or 45-64 (9%) compared with adults ages 65 and older (3%)
- Adults who lived in households with an income of \$25,000-\$49,999 (20%) compared with adults who lived in households with an income of \$50,000 or more (12%)
- Adults who were Boston Housing Authority residents (19%), adults who rented but did not receive rental assistance (16%), and adults with other housing arrangements (21%) compared with adults who owned their home (10%)

The percentage of adults who reported having used marijuana, hashish, or products that contain THC was lower for the following groups:

- Females (9%) compared with males (19%)
- Latino adults (9%) compared with White adults (16%)
- Foreign-born adults who had lived in the United States for more than 10 years (7%) compared with adults who were born in the United States (18%)

Figure 7.46 Non-Medical Marijuana¹ Use Among Adults in the Past Year by Selected Indicators, 2015



* Statistically significant difference when compared to reference group

§ Data not presented due to insufficient sample size

¹ Includes non-medical use of hashish and products that contain tetrahydrocannabinol (THC), the active ingredient in marijuana

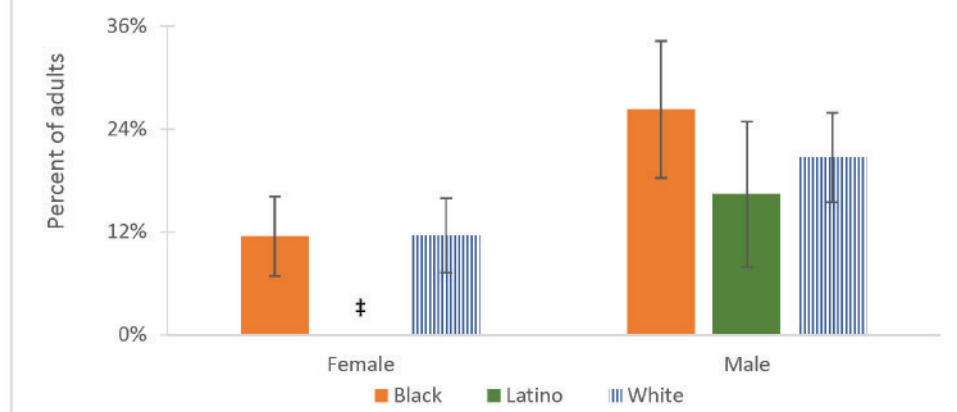
(2) Includes homemakers, students, retirees, and those unable to work

(3) Boston Housing Authority resident

NOTE: Bars with patterns indicate the reference group within each selected indicator.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

Figure 7.47 Non-Medical Marijuana¹ Use Among Adults in the Past Year by Sex and Race/Ethnicity, 2015



† Data not presented due to insufficient sample size

¹ Includes non-medical use of hashish and products that contain tetrahydrocannabinol (THC), the active ingredient in marijuana

NOTE: Bars with patterns indicate the reference group for statistical testing within each selected indicator. Data not presented due to insufficient sample size for Asian female and male residents.

DATA SOURCE: Boston Behavioral Risk Factor Survey (2015), Boston Public Health Commission

In 2015, there was no significant difference in the percentage of Black female Boston adult residents who reported having used marijuana, hashish, or products that contain tetrahydrocannabinol (THC), the active ingredient in marijuana, in the past year compared with White female adults.

Also, there were no significant differences for Black and Latino male adults compared with White male adults.



Summary

Boston has seen significant reductions in smoking and binge drinking among public high school students from 2007 to 2015, and in 2015, Boston high school students also performed better for these indicators compared with U.S. high school students overall. In contrast, a significant increase in recent marijuana use was observed during the same time period, but the percentage of Boston high school students reporting recent marijuana use in 2015 was consistent with U.S. high school students overall.

In 2015, Boston high school students were also less physically active compared with U.S. high school students overall. We observed inequities in health behavior indicators across sex and race/ethnicity. Female students reported less regular physical activity than male students. More White and Latino students reported smoking and binge drinking than Black and Asian students. Higher percentages of Black and Latino students also reported lower vegetable consumption than Asian and White students. The percentage of students reporting daily SSB consumption was almost half-fold for Asian students compared with Black, Latino, and White students. Asian students and students who lived in the U.S. six or fewer years had the lowest percentage of marijuana use.

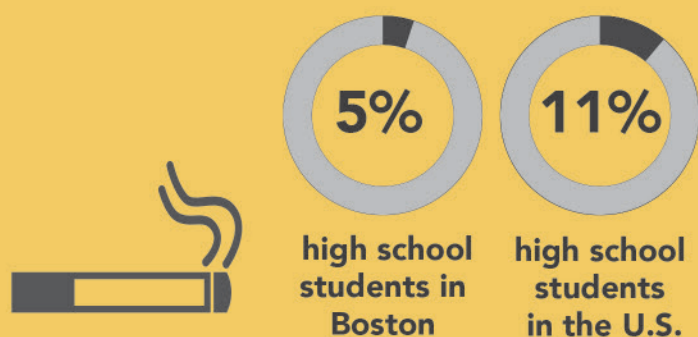
Among Boston adults, percentages for smoking, physical activity, and fruit and vegetable consumption in 2015 were consistent with the U.S. overall, although a higher percentage of binge drinking was observed among Boston adults. The reported percentages of marijuana use and daily SSB consumption among Boston adults are within the range reported in previous analyses of U.S. adults. Many of the health-related behavior indicators were also stable over time, with the exception of physical activity and fruit consumption, with percentages of those reporting healthy behaviors having decreased from 2013 to 2015.

We also identified inequities in health behaviors primarily across sex, race/ethnicity, and other social determinants. The percentages of smoking, binge drinking, marijuana use, daily SSB consumption, and low vegetable consumption were higher in men than women. Compared with White adults, Black and Latino adults had higher percentages of low fruit and vegetable consumption, and of daily consumption of SSBs.

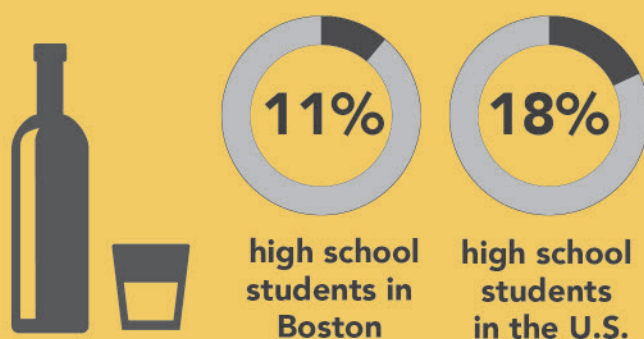
Generally, educational attainment and household income were correlated with unhealthy indicators of smoking, physical activity, and fruit and vegetable consumption. Across categories of housing, percentages of unhealthy behaviors for smoking and SSB consumption were higher among adults who had rental assistance in comparison with adult homeowners. BHA residents also had higher percentages of unhealthy behaviors for physical activity and vegetable consumption in comparison with adult homeowners. In contrast, White adults, and adults who reported higher educational attainment and household income, and adult homeowners, had higher percentages of binge drinking. At the neighborhood level, elevated percentages of unhealthy behaviors were generally clustered in Dorchester (zip codes 02121, 02125), Dorchester (zip codes 02122, 02124), and South Boston. To reduce the inequities in healthy behaviors across sex, race/ethnicity, and social determinants, public health interventions should target subpopulations at highest risk and their social determinants.

Health-Related Behaviors

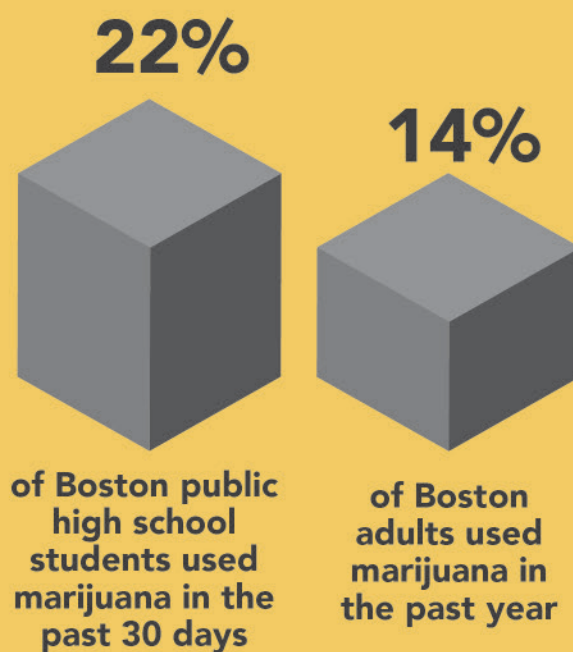
Youth smoking in 2015



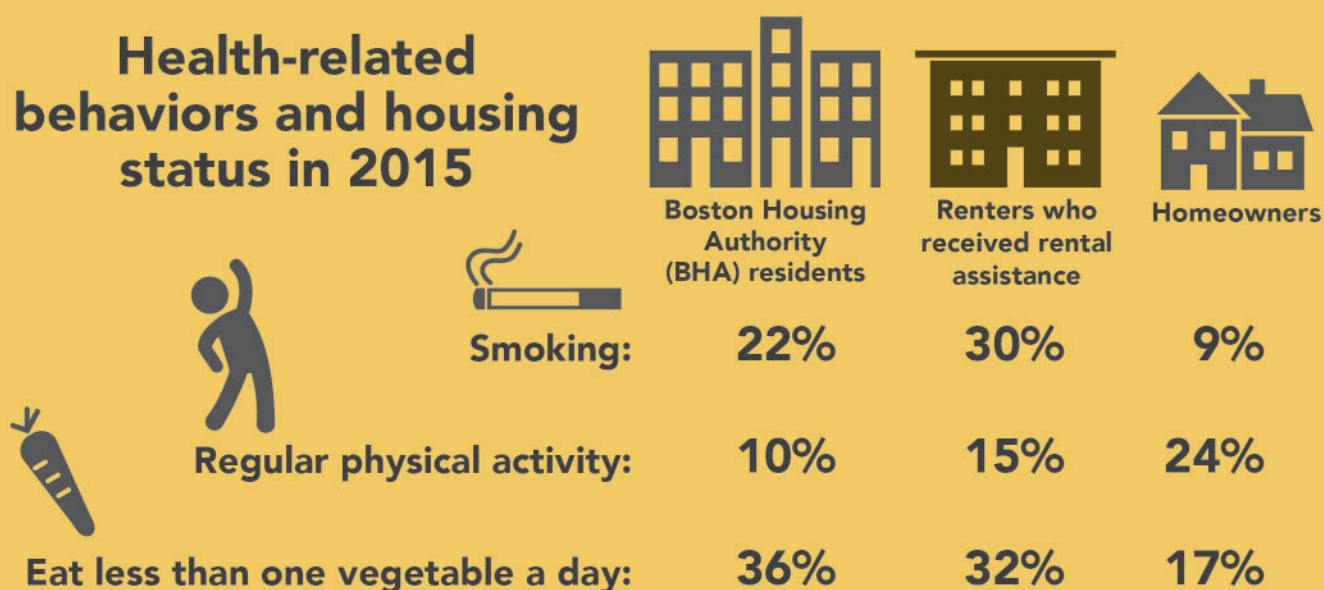
Binge drinking in 2015



Marijuana use in 2015



Health-related behaviors and housing status in 2015



Our Point of View: Thoughts from public health

Creating a city that supports healthy behaviors

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"It is unreasonable to expect that people will change their behavior easily when so many forces in the social, cultural and physical environment conspire against such change."

The Future of the Public's Health in the 21st Century, Institute of Medicine¹

More than a third of deaths in the U.S. are linked to tobacco use and exposure, poor diet, physical inactivity, and excessive alcohol intake.^{2,3} Cigarette smoking is the leading preventable cause of death in the United States, causing more deaths than HIV, illegal drug use, alcohol use, motor vehicle accidents, and firearm-related incidents combined.⁴ The serious health consequences and addictive properties of tobacco elevate the need for public health strategies focused on primary prevention.

The profit-driven food and tobacco industries have significant influences on people's behaviors through aggressive marketing practices. In 2011 the tobacco industry spent \$8.3 billion in advertising⁵ (\$1 billion more than the entire operating budget of the CDC⁶), while in 2013 the beverage industry spent \$814 million advertising sugary beverages.⁷ Marketing strategies frequently target youth, low-income populations, and communities of color.⁸

Public health will never be able to match the billions of dollars that advertise unhealthy products. However, we have many tools at our disposal that have been quite effective.

Looking specifically at tobacco:

- comprehensive tobacco control regulations are in place to protect youth, workers, and residents;
- the business, education, non-profit, and health care communities have implemented smoke-free environments;
- tenants and property owners are working together to create smoke-free homes;
- the city has worked to make smoke-free public parks and ban the sale of tobacco at pharmacies and health care institutions;
- health plans are offering comprehensive tobacco cessation support services.

The good news is social norms are starting to change and we are seeing the benefits of our actions. Youth smoking rates are almost cut in half - from 15% in 2001 to 8% in 2013, and adults are smoking much less too. As creative as we think we have been, new strategies are always needed. Smoking harms nearly every organ of the body. With smoking comes more cancer, chronic obstructive pulmonary disease (COPD), asthma, cardiovascular disease, and reproductive health issues. Strategies that are multi-tiered and include resources to support behavior change will help the many residents struggling to resist or stop smoking.

¹ The Future of the Public's Health in the 21st Century, Institute of Medicine, 2003, p.4.

² AH Mokdad, JS Marks, DF Stroup et al, Actual Causes of Death in the U.S., 2000. JAMA. 2004;291(10):1238-1245

³ J. Michael McGinnis, Actual Causes of Death, 1990-2010, Workshop on Determinants of Premature Mortality, Sept. 18, 2013, National Research Council, Washington, DC. <https://www.ncbi.nlm.nih.gov/books/NBK279981/>

⁴ Centers for Disease Control and Prevention. Health effects of Cigarette Smoking. 2015. https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/.

⁵ Federal Trade Commission, Cigarette report for 2011, 2013, <http://www.ftc.gov/reports/federal-trade-commission-cigarette-report-2011>.

⁶ https://www.cdc.gov/budget/documents/fy2016-fy-2016-cdc-operating-plan_1.pdf

⁷ http://www.sugarydrinkfacts.org/sugary_drink_facts_in_brief.aspx Centers for Disease Control, Smoking and Tobacco Use, Tobacco Industry Marketing https://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/marketing/

⁸ Centers for Disease Control, Smoking and Tobacco Use, Tobacco Industry Marketing https://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/marketing/

Our Point of View: Thoughts from a community resident

Smoking: I can't do this anymore

By Kim Barros

Kim has lived in Boston her whole life

My name is Kim. I am 48 years old and have 3 kids. I have lived in Boston my whole life and graduated from Boston Public Schools. I have a Master's degree in Management and have worked in HIV housing for 25 years.

I grew up mostly in Dorchester and Roxbury. I would walk to the store to buy my mother cigarettes when I was 9 or 10. At that time, there weren't any laws about how old you had to be to buy them. The first time I remember seeing cigarettes advertised was at a gas station – they were advertised for only 67 cents a pack.

I was 14 years old when I started smoking. You could buy a cigarette for 10 cents. I took my first puff on an older friend's cigarette and that was that. I smoked for 25 years. There were many times that quitting crossed my mind. I am a Black Belt in Karate and have been practicing Karate for 20 years. At 19 my breathing started getting bad and I couldn't be as athletic as I wanted. I remember being in the car one day with my kids and they were chanting, "Smoking makes you die. Smoking makes you die."

I tried to quit for 5 years, and it was really hard. I tried smoking cessation, the nicotine replacement patch, gum and an inhaler. Then I had that 'I can't do this anymore' moment. I was going into the hospital for surgery and didn't want to crave cigarettes while in the hospital. A prescription medicine helped me to stop. That was 8 years ago.

As times change, the products and marketing changes. I know a lot of people now that are smoking marijuana in a tobacco leaf, called a fronto leaf. They don't even know that they are smoking tobacco and I know people that have then gotten hooked on tobacco that way. Like any drug, if you try it, before you know it you move from social use to dependency. It's best to not even start.

References

1. Wingard DL, Berkman LF, Brand RJ. A multivariate analysis of health-related practices: a nine-year mortality follow-up of the Alameda County Study. *American journal of epidemiology*. 1982;116(5):765-75.
2. Schoenborn CA, Adams PE. Health behaviors of adults: United States, 2005-2007. *Vital and health statistics Series 10, Data from the National Health Survey*. 2010(245):1-132.
3. Lynch JW, Kaplan GA, Salonen JT. Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Social science & medicine* (1982). 1997;44(6):809-19.
4. Woolf SH, Dekker MM, Byrne FR, Miller WD. Citizen-centered health promotion: building collaborations to facilitate healthy living. *American journal of preventive medicine*. 2011;40(1 Suppl 1):S38-47.
5. Braveman P, Egerter S, Barclay C. What Shapes Health-Related Behaviors? The Role of Social Factors. Robert Wood Johnson Foundation; 2011.
6. Braveman PA, Egerter SA, Mockenhaupt RE. Broadening the focus: the need to address the social determinants of health. *American journal of preventive medicine*. 2011;40(1 Suppl 1):S4-18.
7. Krinsky NI, Landrum JT, Bone RA. Biologic mechanisms of the protective role of lutein and zeaxanthin in the eye. *Annual review of nutrition*. 2003;23:171-201.
8. Brown L, Rimm EB, Seddon JM, Giovannucci EL, Chasan-Taber L, Spiegelman D, et al. A prospective study of carotenoid intake and risk of cataract extraction in US men. *The American journal of clinical nutrition*. 1999;70(4):517-24.
9. Hung HC, Joshipura KJ, Jiang R, Hu FB, Hunter D, Smith-Warner SA, et al. Fruit and vegetable intake and risk of major chronic disease. *Journal of the National Cancer Institute*. 2004;96(21):1577-84.
10. Mozaffarian D. Dietary and Policy Priorities for Cardiovascular Disease, Diabetes, and Obesity: A Comprehensive Review. *Circulation*. 2016;133(2):187-225.
11. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data [online] 2015 [02/06/17]. Available from: <https://www.cdc.gov/brfss/brfssprevalence/>.
12. Youth Risk Behavior Survey Data [Internet]. 2015 [cited 12/6/16]. Available from: www.cdc.gov/yrbs.
13. Centers for Disease Control and Prevention, Division of Nutrition Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. Physical activity and Health [01/04/17]. Available from: <https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm>.
14. Centers for Disease Control and Prevention, Division of Nutrition Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. How much physical activity do children need? [01/04/17]. Available from: <https://www.cdc.gov/physicalactivity/basics/children/index.htm>.
15. Centers for Disease Control and Prevention, Division of Nutrition Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. How much physical activity do adults need? [01/04/17]. Available from: <https://www.cdc.gov/physicalactivity/basics/adults/index.htm>.

16. Centers for Disease Control and Prevention, Division of Nutrition Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. How much physical activity do older adults need? [01/04/17]. Available from: https://www.cdc.gov/physicalactivity/basics/older_adults/.
17. US Department of Health and Human Services, US Department of Agriculture. 2015–2020 Dietary Guidelines for Americans, 8th Edition 2015 [02/08/17]. Available from: <http://health.gov/dietaryguidelines/2015/guidelines/>.
18. Poti JM, Slining MM, Popkin BM. Where are kids getting their empty calories? Stores, schools, and fast-food restaurants each played an important role in empty calorie intake among US children during 2009-2010. *Journal of the Academy of Nutrition and Dietetics*. 2014;114(6):908-17.
19. Reedy J, Krebs-Smith SM. Dietary sources of energy, solid fats, and added sugars among children and adolescents in the United States. *Journal of the American Dietetic Association*. 2010;110(10):1477-84.
20. American Academy of Pediatrics. What families can do. Prevention and Treatment of Childhood Overweight and Obesity [01/06/17]. Available from: <http://www2.aap.org/obesity/families.html?technology=1>.
21. Johnson RK, Appel LJ, Brands M, Howard BV, Lefevre M, Lustig RH, et al. Dietary sugars intake and cardiovascular health: a scientific statement from the American Heart Association. *Circulation*. 2009;120(11):1011-20.
22. Park S, Xu F, Town M, Blanck HM. Prevalence of Sugar-Sweetened Beverage Intake Among Adults--23 States and the District of Columbia, 2013. *MMWR Morbidity and mortality weekly report*. 2016;65(7):169-74.
23. Black and Hispanic Youth Disproportionately Targeted With Advertising for Unhealthy Food and Beverages [press release]. Robert Wood Johnson Foundation, 8/11/15.
24. Cradock AL, McHugh A, Mont-Ferguson H, Grant L, Barrett JL, Wang YC, et al. Effect of school district policy change on consumption of sugar-sweetened beverages among high school students, Boston, Massachusetts, 2004-2006. *Preventing chronic disease*. 2011;8(4):A74.
25. Chriqui JF, Pickel M, Story M. Influence of school competitive food and beverage policies on obesity, consumption, and availability: a systematic review. *JAMA pediatrics*. 2014;168(3):279-86.
26. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services; 2014.
27. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. A Report of the Surgeon General: How Tobacco Smoke Causes Disease. Washington D.C.: US Dept. of Health and Human Services; 2010.
28. Jamal A, King BA, Neff LJ, Whitmill J, Babb SD, Graffunder CM. Current Cigarette Smoking Among Adults - United States, 2005-2015. *MMWR Morbidity and mortality weekly report*. 2016;65(44):1205-11.
29. Barbeau EM, Krieger N, Soobader MJ. Working class matters: socioeconomic disadvantage, race/ethnicity, gender, and smoking in NHIS 2000. *American journal of public health*. 2004;94(2):269-78.
30. Cohen SS, Sonderman JS, Mumma MT, Signorello LB, Blot WJ. Individual and neighborhood-level socioeconomic characteristics in relation to smoking prevalence among black and white adults in the Southeastern United States: a cross-sectional study. *BMC public health*. 2011;11:877.

31. Chuang YC, Cubbin C, Ahn D, Winkleby MA. Effects of neighbourhood socioeconomic status and convenience store concentration on individual level smoking. *Journal of epidemiology and community health*. 2005;59(7):568-73.
32. US Department of Health and Human Services. Preventing Tobacco Use Among Youth and Young Adults: Fact Sheet [12/22/16]. Available from: <http://www.surgeongeneral.gov/library/reports/preventing-youth-tobacco-use/factsheet.html>.
33. Centers for Disease Control and Prevention. Tobacco Industry Marketing 2016 [02/08/17]. Available from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/tobacco_industry/marketing/index.htm.
34. Moss HB. The impact of alcohol on society: a brief overview. *Social work in public health*. 2013;28(3-4):175-7.
35. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Actual causes of death in the United States, 2000. *Jama*. 2004;291(10):1238-45.
36. Bouchery EE, Harwood HJ, Sacks JJ, Simon CJ, Brewer RD. Economic costs of excessive alcohol consumption in the U.S., 2006. *American journal of preventive medicine*. 2011;41(5):516-24.
37. Petit G, Maurage P, Kornreich C, Verbanck P, Campanella S. Binge drinking in adolescents: a review of neurophysiological and neuroimaging research. *Alcohol and alcoholism (Oxford, Oxfordshire)*. 2014;49(2):198-206.
38. Bonomo YA, Bowes G, Coffey C, Carlin JB, Patton GC. Teenage drinking and the onset of alcohol dependence: a cohort study over seven years. *Addiction (Abingdon, England)*. 2004;99(12):1520-8.
39. McCarty CA, Ebel BE, Garrison MM, DiGiuseppe DL, Christakis DA, Rivara FP. Continuity of binge and harmful drinking from late adolescence to early adulthood. *Pediatrics*. 2004;114(3):714-9.
40. Grant BF, Dawson DA. Age of onset of drug use and its association with DSM-IV drug abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of substance abuse*. 1998;10(2):163-73.
41. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV). Washington, D.C.1994.
42. Centers for Disease Control and Prevention. Marijuana and Public Health [03/31/17]. Available from: <https://www.cdc.gov/marijuana/>.
43. Governing Data: State Marijuana Laws in 2017 Map: Governing; [03/31/17]. Available from: <http://www.governing.com/gov-data/state-marijuana-laws-map-medical-recreational.html>.
44. Boston Public Health Commission. Medical Marijuana [03/31/17]. Available from: <http://www.bphc.org/workingwithus/permits/Pages/Permits.aspx>.
45. Center for Behavioral Health Statistics and Quality. 2015 National Survey on Drug Use and Health: Detailed Tables. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2016.
46. Azofeifa A, Mattson ME, Schauer G, McAfee T, Grant A, Lyerla R. National Estimates of Marijuana Use and Related Indicators - National Survey on Drug Use and Health, United States, 2002-2014. *Morbidity and mortality weekly report Surveillance summaries (Washington, DC : 2002)*. 2016;65(11):1-28.
47. Centers for Disease Control and Prevention. Marijuana and Public Health: Health Effects [03/31/17]. Available from: <https://www.cdc.gov/marijuana/health-effects.htm>.